

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

MOLECULAR REBAR DESIGN, LLC, AND
BLACK DIAMOND STRUCTURES, LLC,

Plaintiffs,

v.

LG ENERGY SOLUTION, LTD.,

Defendant.

Case No. 2:24-cv-00107-JRG
(Lead Case)

JURY TRIAL DEMANDED

MOLECULAR REBAR DESIGN, LLC, AND
BLACK DIAMOND STRUCTURES, LLC,

Plaintiffs,

v.

SAMSUNG ELECTRONICS CO., LTD,
AND SAMSUNG ELECTRONICS
AMERICA, INC.,

Defendants.

Case No. 2:24-cv-00108-JRG
(Member Case)

JURY TRIAL DEMANDED

**PLAINTIFFS' DISCLOSURE OF ASSERTED CLAIMS AND INFRINGEMENT
CONTENTIONS PURSUANT TO LOCAL PATENT RULES 3-1 AND 3-2**

Pursuant to Local Patent Rules 3-1 and 3-2, Plaintiffs Molecular Rebar Design, LLC and Black Diamond Structures, LLC (collectively, "MRD"), hereby serve their Disclosure of Asserted Claims and Infringement Contentions and accompanying documents on Defendant LG Energy Solution, Ltd., ("LG").

MRD makes these contentions based on the information reasonably available to it at this time and reserves the right to supplement and/or amend these contentions.

I. Patent Rule 3-1(a) Disclosures

Based upon information presently available, MRD asserts that Defendant directly and indirectly infringes the claims identified in the claim charts that accompany these disclosures. MRD makes this disclosure based on information reasonably available to it at this time and reserves its right to supplement and/or amend its disclosure of Asserted Claims.

II. Patent Rule 3-1(b) Disclosures

In Exhibit 1 included herein, MRD identifies, for each asserted claim, each accused infringing apparatus, product, device, process, method, act, or other instrumentality of LG of which MRD is aware. MRD makes this disclosure based on information reasonably available to it at this time and reserves its right to supplement and/or amend its disclosure of the Accused Instrumentalities, including to identify additional Accused Instrumentalities.

III. Patent Rule 3-1(c) Disclosures

MRD's detailed infringement assertions are contained in the claim charts that accompany these disclosures. MRD makes this disclosure based on information reasonably available to it at this time and reserves its right to supplement and/or amend its disclosure.

IV. Patent Rule 3-1(d) Disclosures

MRD asserts that Defendant literally infringes each asserted claim. To the extent that any particular element is shown not to be met literally, MRD contends that Defendant infringes under the Doctrine of Equivalents as there would be no substantial difference between the elements of the asserted claims and the corresponding functionality in the accused instrumentality, *i.e.*, the corresponding functionality in the Accused Products does substantially the same thing, in substantially the same way, to achieve substantially the same result(s) as the claimed elements.

MRD makes this disclosure based on information reasonably available to it at this time and reserves its right to supplement and/or amend its disclosure.

V. Patent Rule 3-1(e) Disclosures

The Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than September 17, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than September 27, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than October 5, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than October 7, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than October 8, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than October 19, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than October 21, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than November 3, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date no later than November 16, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 are entitled to a priority date no later than February 7, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than February 10, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than February 12, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date no later than March 2, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than May 1, 2009. In the alternative, the Asserted Claims of U.S.

Patent No. 8,808,909 B2 are entitled to a priority date of no later than August 24, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than September 4, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than October 26, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than December 12, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than March 15, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date no later than May 12, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date no later than June 9, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than July 25, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date no later than November 7, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date no later than December 17, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than March 2, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date no later than March 11, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than April 10, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date no later than June 23, 2011, including through the filing of Provisional Application No. 61/500560. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than November 10, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than March 15, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909

B2 are entitled to a priority date of no later than March 26, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date of no later than May 30, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 8,808,909 B2 are entitled to a priority date no later than June 21, 2012, including through the filing of Application No. 14/128,392.

The Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than September 17, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than September 27, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than October 5, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than October 7, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than October 8, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than October 19, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than October 21, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than November 3, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no later than November 16, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no later than February 7, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than February 10, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than February 12, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no

later than March 2, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than May 1, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than August 24, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than September 4, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than October 26, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than December 12, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than March 15, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no later than May 12, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no later than June 9, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than July 25, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no later than November 7, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no later than December 17, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than March 2, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no later than March 11, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than April 10, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than November 10, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than March 15, 2012. In the alternative, the Asserted Claims of U.S.

Patent No. 10,608,282 B2 are entitled to a priority date of no later than March 26, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date of no later than May 30, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no later than June 21, 2012, including through the filing of Provisional Application No. 61/663,513. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no later than June 22, 2012, including through the filing of Provisional Application No. 61/662,393. In the alternative, the Asserted Claims of U.S. Patent No. 10,608,282 B2 are entitled to a priority date no later than June 21, 2013, including through the filing of Application No. 14/390,902.

The Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than September 17, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than September 27, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than October 5, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than October 7, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than October 8, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than October 19, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than October 21, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than November 3, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 are entitled to a priority date no later than November 16, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date no later than February 7, 2009. In the

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alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than March 11, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than April 10, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than November 10, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date no later than December 12, 2011, including through the filing of Patent Application No. 13/993,206. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than March 15, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than March 26, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date of no later than May 30, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date no later than October 27, 2015, including through the filing of Patent Application No. 14/924,246. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date no later than May 27, 2016, including through the filing of Patent Application No. 15/166,931. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date no later than August 1, 2016, including through the filing of Patent Application No. 15/166,931. In the alternative, the Asserted Claims of U.S. Patent No. 9,636,649 B2 are entitled to a priority date no later than October 7, 2016, including through the filing of Patent Application No. 15/288/553.

The Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than September 17, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than September 27, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than

October 5, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than October 7, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than October 8, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than October 19, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than October 21, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than November 3, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date no later than November 16, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date no later than February 7, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than February 10, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than February 12, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date no later than March 2, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than May 1, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than August 24, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than September 4, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than October 26, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than December 12, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than March 15, 2010. In the alternative, the Asserted Claims

of U.S. Patent No. 8,968,924 B2 are entitled to a priority date no later than May 12, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date no later than June 9, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than July 25, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date no later than November 7, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date no later than December 17, 2010. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than March 2, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date no later than March 11, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than April 10, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date no later than June 23, 2011, including through the filing of Provisional Application No. 61/500560. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than November 10, 2011. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than March 15, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than March 26, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date of no later than May 30, 2012. In the alternative, the Asserted Claims of U.S. Patent No. 8,968,924 B2 are entitled to a priority date no later than June 21, 2012, including through the filing of Application No. 14/128,392.

The Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than September 17, 2008. In the alternative, the Asserted Claims of U.S. Patent No.

10,153,483 B2 are entitled to a priority date of no later than September 27, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than October 5, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than October 7, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than October 8, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than October 19, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than October 21, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than November 3, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date no later than November 16, 2008. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date no later than February 7, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than February 10, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than February 12, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date no later than March 2, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than May 1, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than August 24, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than September 4, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later than October 26, 2009. In the alternative, the Asserted Claims of U.S. Patent No. 10,153,483 B2 are entitled to a priority date of no later

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VI. Patent Rule 3-1(f) Disclosures

With respect to the '649 Patent, MRD identifies the following products, devices, processes, methods, acts, or other instrumentalities that incorporate or reflect Claims 1, 2, and 11 of that Patent: Pb1xx0 Series (Auto); Pb2xx0 Series (Deep Cycle); Pb3xx0 Series (Storage); Pb4xx0 Series (Traction); PbAC (AntiCorrosion); PbLite (Process Aid); Li2151; and Li3281. With respect to the '282 Patent, MRD identifies the following products, devices, processes, methods, acts, or other instrumentalities that incorporate or reflect Claims, 1, 5, 6, 7, and 8 of that Patent: Pb1xx0 Series (Auto); Pb2xx0 Series (Deep Cycle); Pb3xx0 Series (Storage); Pb4xx0 Series (Traction); PbAC (AntiCorrosion); PbLite (Process Aid); Li2151; and Li3281. MRD makes this disclosure based on information reasonably available to it at this time and reserve its right to supplement and/or amend its disclosure.

VII. Patent Rule 3-2(a) Documents

MRD presently is not relying on documents evidencing any discussion with, disclosure to, or other manner of providing to a third party, or sale of or offer to sell, the claimed invention prior to the date of application for the patent in suit. MRD makes this disclosure based on information reasonably available to it at this time and reserve its right to supplement and/or amend its disclosure.

VIII. Patent Rule 3-2(b) Documents

Non-privileged documents evidencing the conception, reduction to practice, design, and development of each claimed invention and their respective families, which were created on or before the date of application for the patent in suit or the priority date identified pursuant to Patent Rule 3-1(e) are being concurrently produced bearing Bates numbers MRD-0000003083–MRD-0000003698.

MRD makes this disclosure based on information reasonably available to it at this time and reserve its right to supplement and/or amend its disclosure.

IX. Patent Rule 3-2(c) Documents

A copy of the file history and issued patent for each of the Asserted Patents is being concurrently produced bearing Bates numbers MRD-0000000001–MRD-0000003082.

Date: May 15, 2024

Respectfully submitted,
/s/ Andres Healy
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Exhibit 1

Molecular Rebar Design, LLC et al. v. LG Energy Solution, LTD., No. 2:24-cv-107 (E.D. Tex.)
Infringement of Asserted Patents; U.S. Patent No. 3.1(b)

This chart identifies for each asserted claim, each accused apparatus, product, device, process, method, act, or other instrumentality (“Accused Product”) of LG Energy Solution, Ltd, (“LG”) of which Molecular Rebar Design, LLC and Black Diamond Structures, LLC (collectively, “MRD”) is aware.

MRD notes that the below chart contains an exemplary, non-limiting identification of each Accused Product. MRD makes these contentions based on the information reasonably available to it at this time and before LG has provided any technical materials or source code. MRD reserves the right to modify, supplement, and/or amend these contentions as additional evidence and information become available, including in light of discovery, invalidity, prior art, claim construction, or any information provided.

Molecular Rebar Design, LLC et al. v. LG Energy Solution, LTD., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of Asserted Patents; U.S. Patent No. 3.1(b)

U.S. Patent No. 8,808,909

Accused Product
• HG2 battery • HG6 battery • MJ1 18650INR battery • E78 battery • Gram Laptop ‘18 battery • Gram Laptop ‘22 battery • G8 Cell Phone ‘19 battery • Any variants, precursor, or subsequent models of each of the above Accused Products; • Any fast-charging batteries using, including, or incorporating carbon nanotubes (“CNTs”); • Any high-rate discharge batteries using, including, or incorporating CNTs; • Any e-vehicle, computer, electronic wearable, cellular device, home battery backup, residential energy storage, or similar or related product, instrumentality, device, or technology using, including, or incorporating CNTs.

Molecular Rebar Design, LLC et al. v. LG Energy Solution, LTD., No. 2:24-cv-107 (E.D. Tex.)
Infringement of Asserted Patents; U.S. Patent No. 3.1(b)

U.S. Patent No. 8,968,924

Accused Product
• HG2 battery • HG6 battery • MJ1 18650INR battery • E78 battery • Gram Laptop ‘18 battery • Gram Laptop ‘22 battery • G8 Cell Phone ‘19 battery • Any variants, precursor, or subsequent models of each of the above Accused Products; • Any fast-charging batteries using, including, or incorporating CNTs; • Any high-rate discharge batteries using, including, or incorporating CNTs; • Any e-vehicle, computer, electronic wearable, cellular device, home battery backup, residential energy storage, or similar or related product, instrumentality, device, or technology using, including, or incorporating CNTs.

Molecular Rebar Design, LLC et al. v. LG Energy Solution, LTD., No. 2:24-cv-107 (E.D. Tex.)
Infringement of Asserted Patents; U.S. Patent No. 3.1(b)

U.S. Patent No. 9,636,649

Accused Product
• HG2 battery • HG6 battery • MJ1 18650INR battery • E78 battery • Gram Laptop ‘18 battery • Gram Laptop ‘22 battery • G8 Cell Phone ‘19 battery • Any variants, precursor, or subsequent models of each of the above Accused Products; • Any fast-charging batteries using, including, or incorporating CNTs; • Any high-rate discharge batteries using, including, or incorporating CNTs; • Any e-vehicle, computer, electronic wearable, cellular device, home battery backup, residential energy storage, or similar or related product, instrumentality, device, or technology using, including, or incorporating CNTs.

Molecular Rebar Design, LLC et al. v. LG Energy Solution, LTD., No. 2:24-cv-107 (E.D. Tex.)
Infringement of Asserted Patents; U.S. Patent No. 3.1(b)

U.S. Patent No. 10,153,483

Accused Product
• HG2 battery • HG6 battery • MJ1 18650INR battery • E78 battery • Gram Laptop '18 battery • Gram Laptop '22 battery • G8 Cell Phone '19 battery • Any variants, precursor, or subsequent models of each of the above Accused Products; • Any fast-charging batteries using, including, or incorporating CNTs; • Any high-rate discharge batteries using, including, or incorporating CNTs; • Any e-vehicle, computer, electronic wearable, cellular device, home battery backup, residential energy storage, or similar or related product, instrumentality, device, or technology using, including, or incorporating CNTs.

Molecular Rebar Design, LLC et al. v. LG Energy Solution, LTD., No. 2:24-cv-107 (E.D. Tex.)

Infringement of Asserted Patents; U.S. Patent No. 3.1(b)

U.S. Patent No. 10,608,282

Accused Product
• HG2 battery • HG6 battery • MJ1 18650INR battery • E78 battery • Gram Laptop ‘18 battery • Gram Laptop ‘22 battery • G8 Cell Phone ‘19 battery • Any variants, precursor, or subsequent models of each of the above Accused Products; • Any fast-charging batteries using, including, or incorporating CNTs; • Any high-rate discharge batteries using, including, or incorporating CNTs; • Any e-vehicle, computer, electronic wearable, cellular device, home battery backup, residential energy storage, or similar or related product, instrumentality, device, or technology using, including, or incorporating CNTs.

Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)

Infringement of U.S. Patent No. 10,153,483

This chart shows on an element-by-element basis how Molecular Rebar Design, LLC and Black Diamond Structures, LLC (collectively, “MRD”) contend that LG Energy Solution, Ltd. (“LG”) infringes Claims 1, 2, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 of U.S. Patent No. 10,153,483 (the “’483 Patent”) through the making, using, offering for sale, sale, and/or importation of the products identified on Exhibit 1, as well as any other products that LG makes, uses, offers for sale, sells, and/or imports that operate in the manner set forth below, including any subsequent versions or releases of such products (collectively, the “’483 Accused Products”).

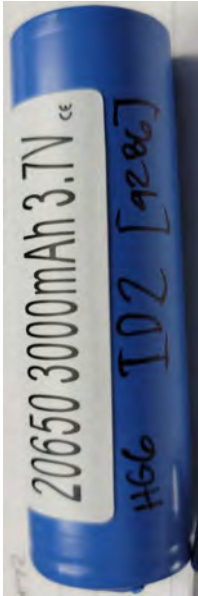
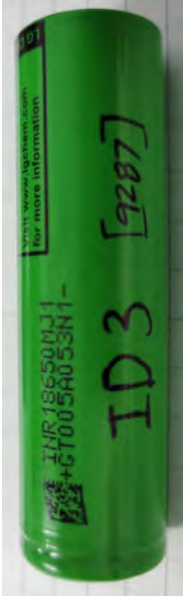
LG also indirectly infringes each asserted claim in violation of 35 U.S.C. §271(b) by taking active steps to encourage and facilitate direct infringement by third parties in the United States, including customers, partners, and service providers, through the dissemination of the ’483 Accused Products and the creation and dissemination of marketing and promotional materials, supporting materials, instructions, product manuals, and/or technical information relating to such products with knowledge and the specific intent that its efforts would result in the direct infringement of the ’483 Patent. For example, LG announced in 2023 that it expected to triple energy storage “division’s global sales in five years, fueled by the remarkable expansion of the U.S. market.” LG Energy Solution, *LG Energy Solution Announces U.S. Market Strategies for ESS*, <https://news.lgensol.com/companynews/press-releases/2108> (last visited February 15, 2024). It also announced in 2023 that it was “set to launch a new residential energy storage system in the U.S. in November.” LG, *LG Energy Solution enblock S to Make U.S. Debut in November*, <https://news.lgensol.com/companynews/press-releases/2210> (last visited February 15, 2024). It also announced in 2023 that it had “signed a supply agreement for lithium-ion battery modules to be used in Toyota battery electric vehicles (BEVs) that will be assembled in the United States.” LG, *LG Energy Solution and Toyota Sign Long-term Battery Supply Agreement to Power Electric Vehicles in the U.S.*, <https://news.lgensol.com/company-news/press-releases/2177> (last visited February 15, 2024). LG thus induced, and continues to actively induce, the direct infringement of the ’483 Patent by service providers and other customers by distributing the ’483 Accused Products and by, among other things, creating and distributing various programs that train customers to use them in an infringing manner.

MRD notes that the below chart contains an exemplary, non-limiting description of how each ’483 Accused Product infringes the ’483 Patent. MRD makes these contentions based on the information reasonably available to it at this time and before LG has provided any technical materials or source code. MRD reserves the right to modify, supplement, and/or amend these contentions as additional evidence and information become available, including in light of discovery, invalidity, prior art, claim construction, or any information provided.

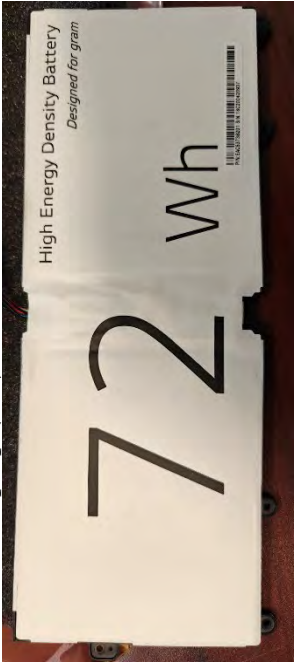
As demonstrated below, MRD contends that each element of each asserted claim is literally infringed by the ’483 Accused Products. MRD further contends that, to the extent that any particular element is not met literally by the ’483 Accused Products, each ’483 Accused Product infringes under the doctrine of equivalents for the reasons set forth below because there would be no substantial difference between the elements of the asserted claims and the corresponding functionality in the accused instrumentality, i.e., the corresponding

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functionality in the '483 Accused Products does substantially the same thing, in substantially the same way, to achieve substantially the same result(s) as the claimed elements.

Claim		Contention
1	A composition useful for lithium-ion batteries comprising:	To the extent that the preamble is limiting, it is met by the '483 Accused Products, each of which comprises "[a] composition useful for lithium-ion batteries." Specifically, each of the '483 Accused Products is a battery that comprises lithium-ion cells and/or pouches. For example, LG has stated that "the two most widely used mixtures are NCM (<u>Li</u>, O, Ni, Co, Mn) and NCA (<u>Li</u>, Ni, Co, Al, O)." https://blog.lgchem.com/en/2023/05/31_cathode_material/. Further, LG also utilizes a mixture comprised of LCO (<u>Li</u>, Co, O) and LFP (<u>Li</u>, Iron, Phosphate). Examples of such batteries are depicted below. LG HG2:  LG HG6:  LG MJ1: 

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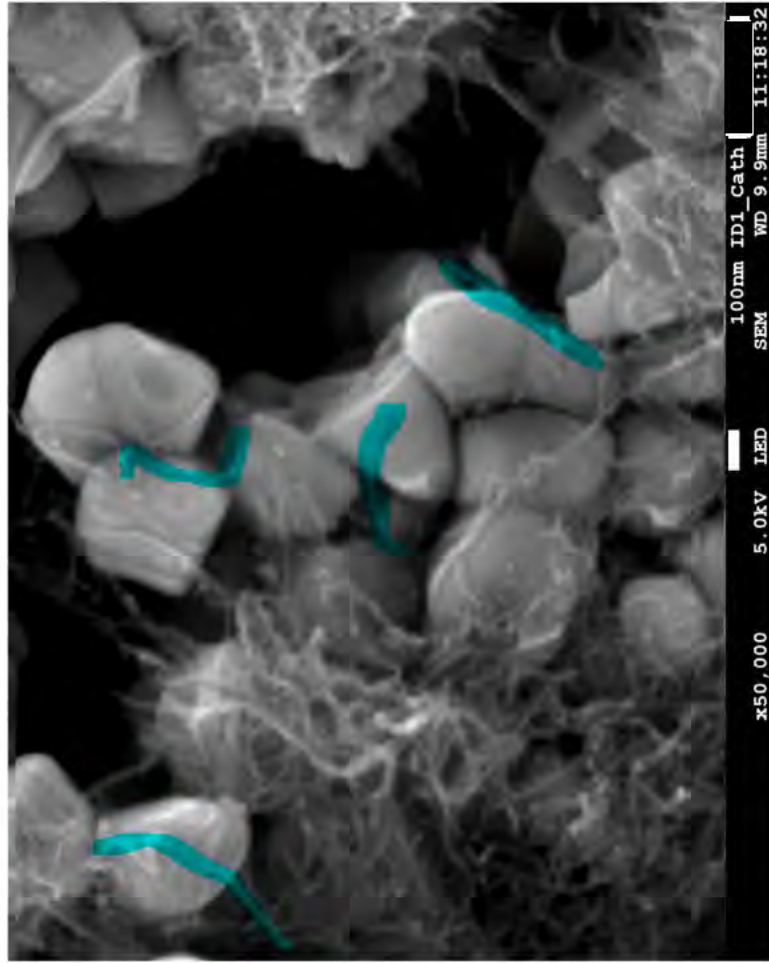
Claim		Contention
		LG Gram Laptop ('22):  LG E78 eVehicle/ESS Pouch:  LG Gram Laptop ('19): 

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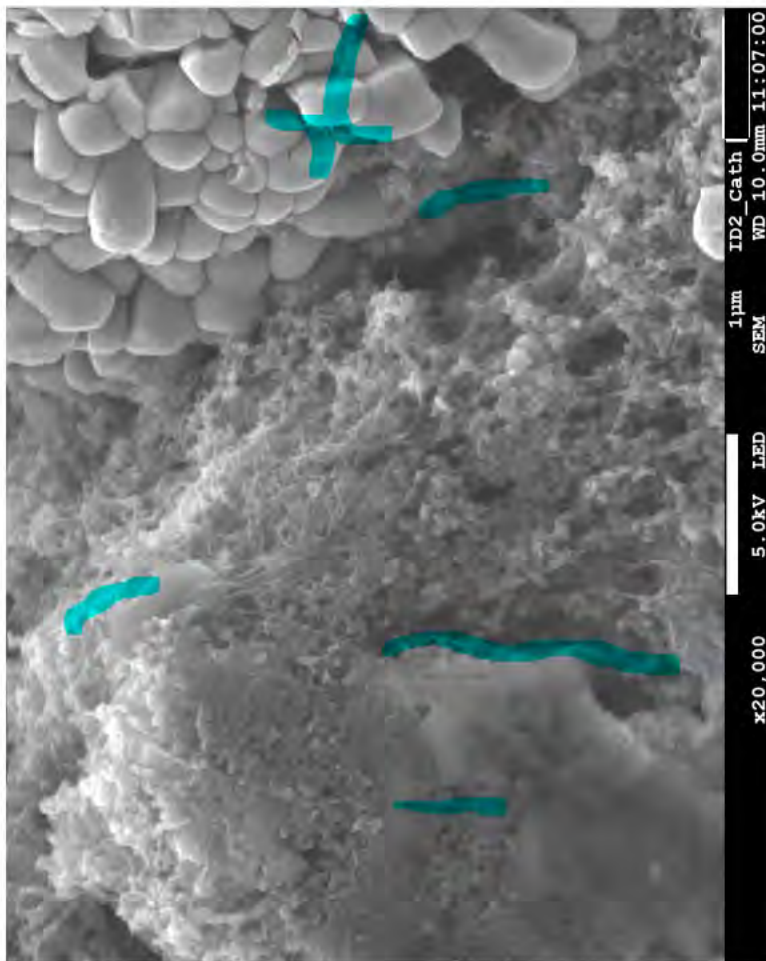
Claim	Contention
	LG G8 Cellphone Battery ('19): 
discrete, non-agglomerated, and exfoliated carbon nanotubes having a surface,	This element is met by the '483 Accused Products, each of which comprises “discrete, non-agglomerated, and exfoliated carbon nanotubes having a surface.” Specifically, each of the '483 Accused Products comprises discrete, non-agglomerated, and exfoliated carbon nanotubes that have at least one surface.

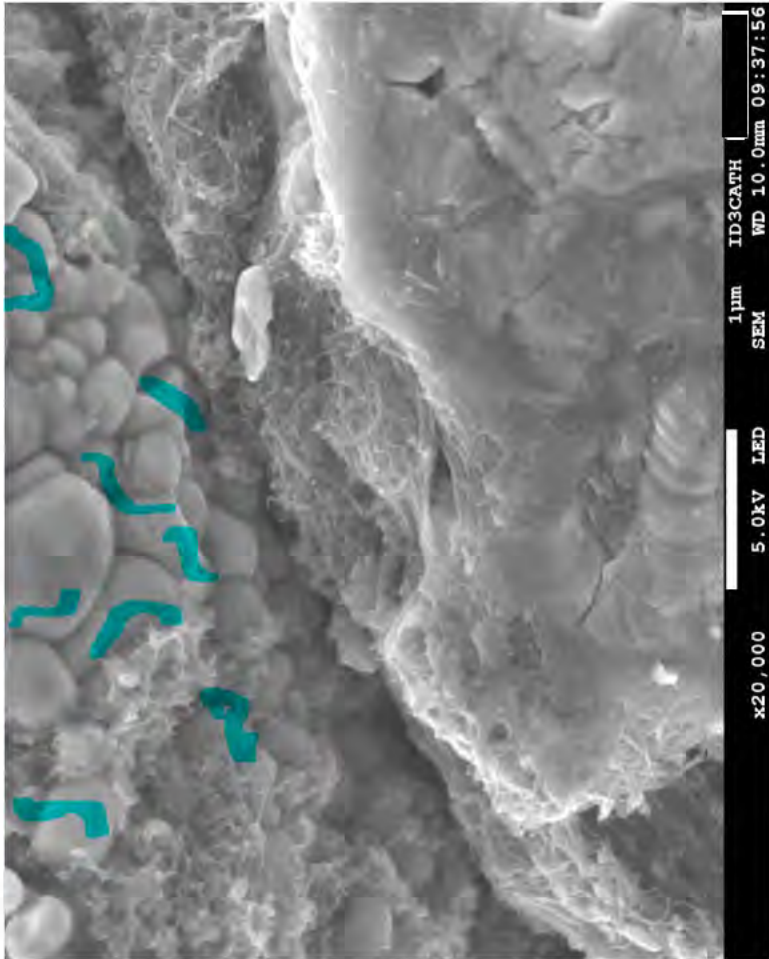
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
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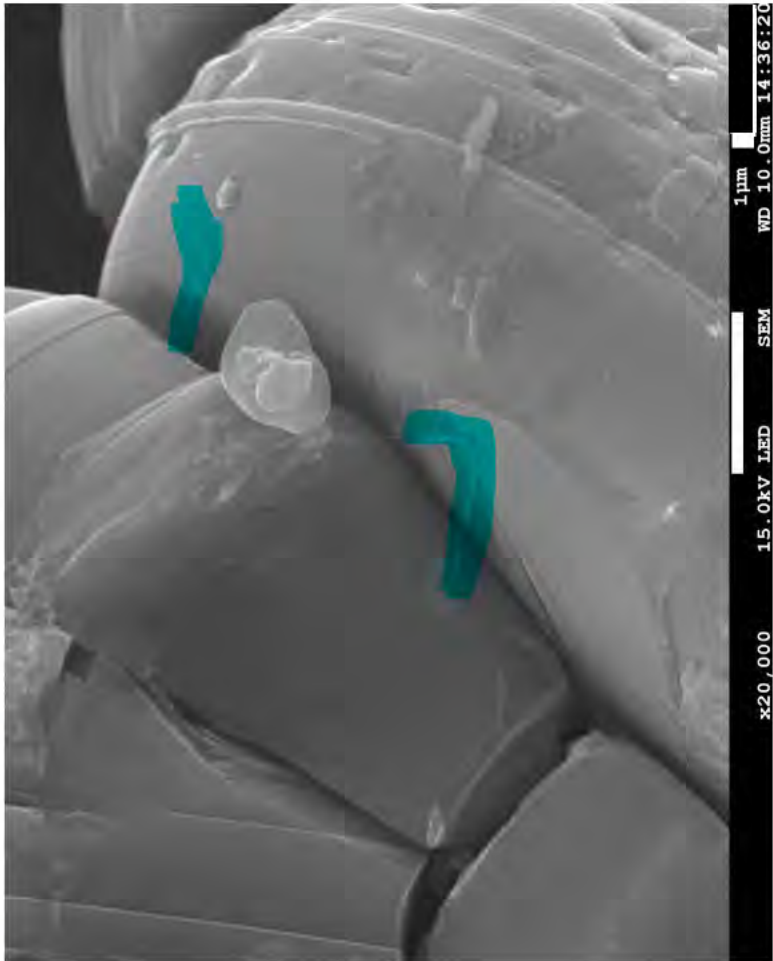
This is demonstrated by the below images relating to certain representative '483 Accused Products, which reflects that HG2 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface.

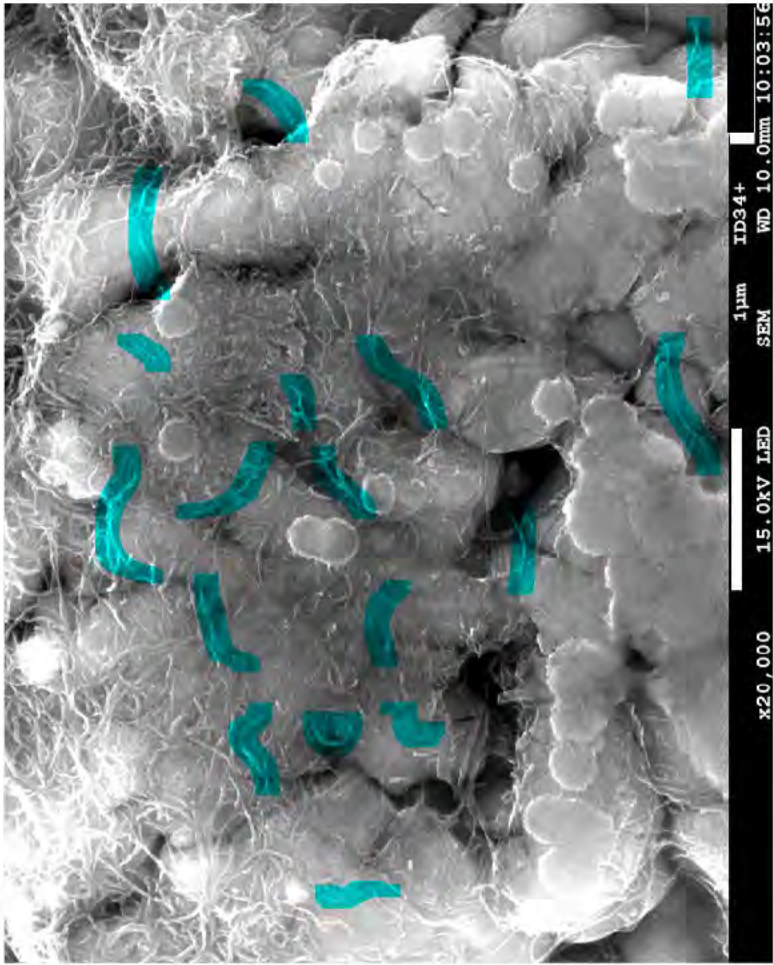


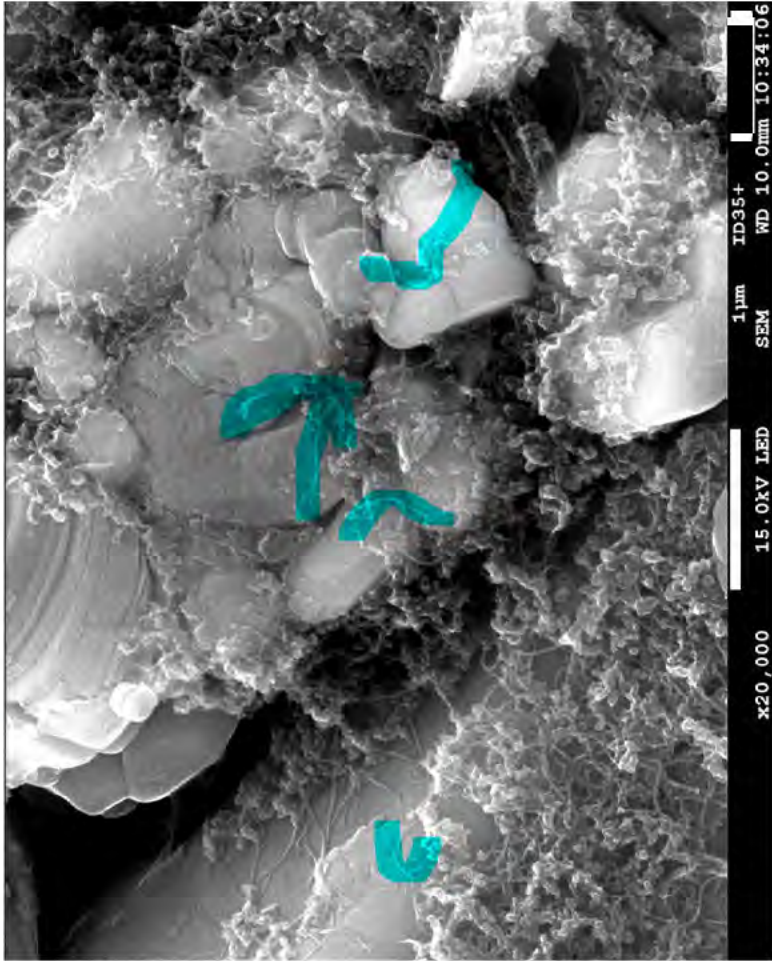
As another example, as depicted below, HG6 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface.



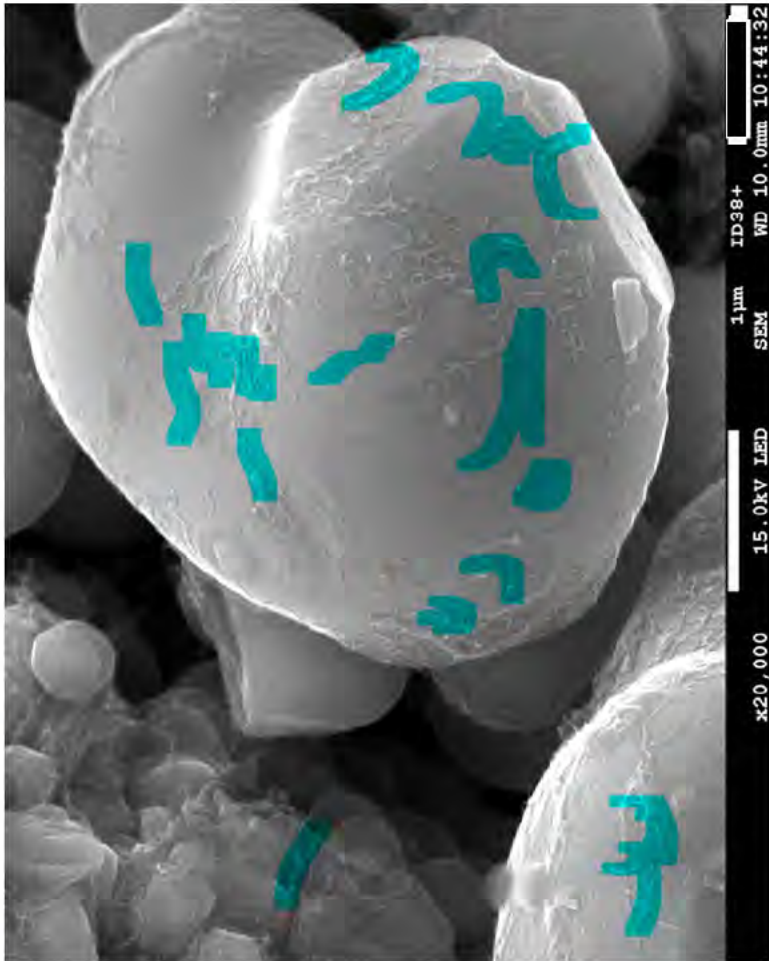
Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 

Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface.  The SEM image shows a textured surface with various ridges and valleys. Two specific features are highlighted with blue brush strokes: one is a small, rounded protrusion on the left, and the other is a more elongated, curved feature on the right. A technical data bar at the bottom of the image provides the following information: x20,000 magnification, 15.0kV voltage, LED detector, SEM mode, a 1µm scale bar, WD 10.0mm, and a timestamp of 14:36:20.

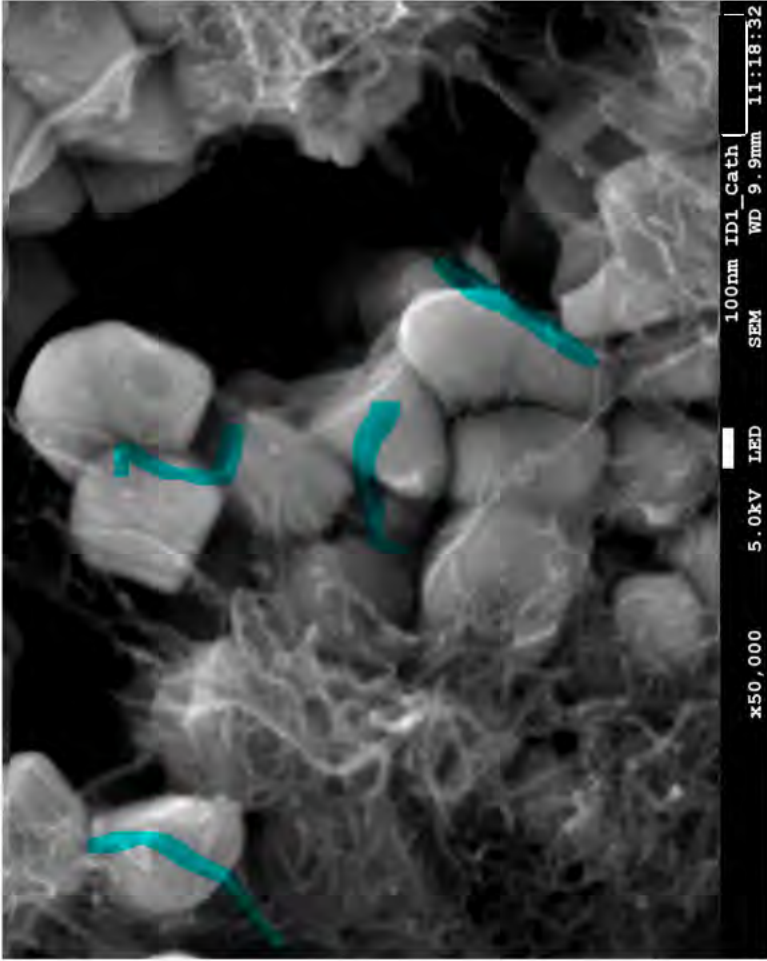
Claim	Contention
	As another example, as depicted below, E78 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 

Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 

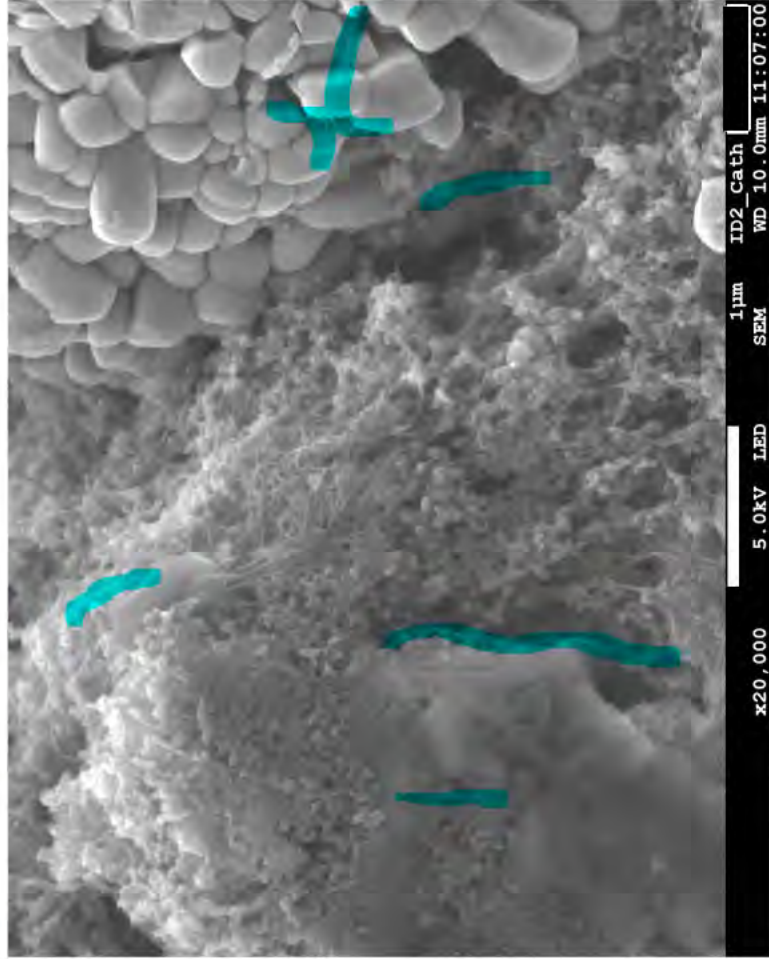
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

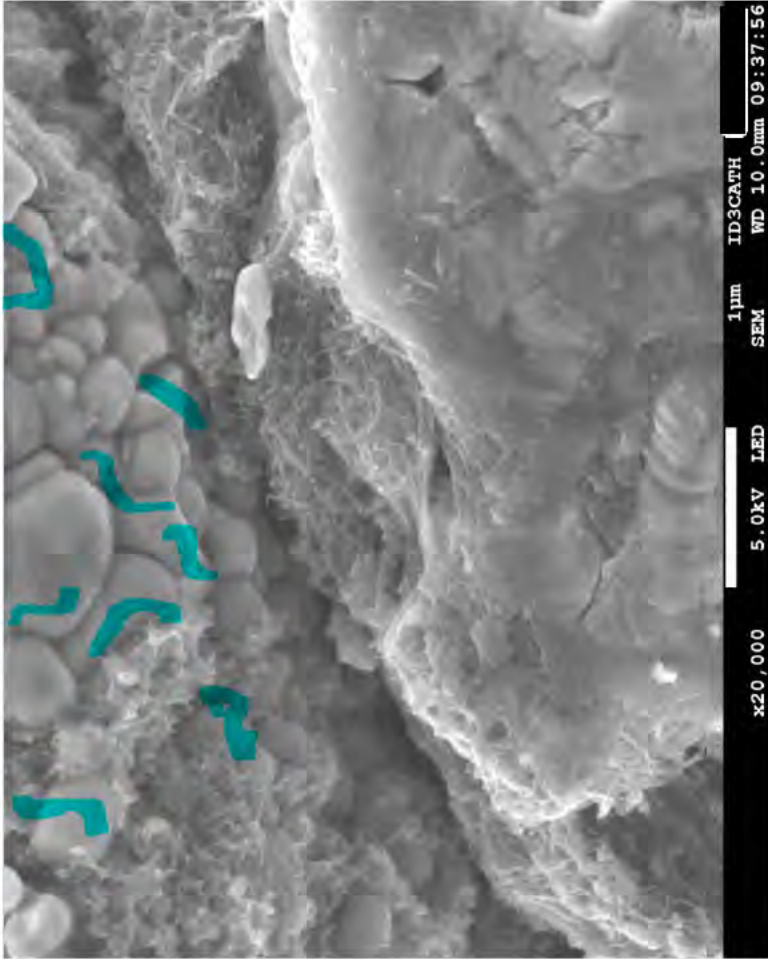
Claim	Contention
	As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 
and mixtures of ion active materials comprising migratable ions[,] said materials comprising crystals or layers of lithium ion active material.” Specifically, each of the '483 Accused Products comprises mixtures of ion active materials comprising migratable ions, such as those comprising the electrolyte (e.g., Li⁺ / PF6⁻).	

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 Infringement of U.S. Patent No. 10,153,483

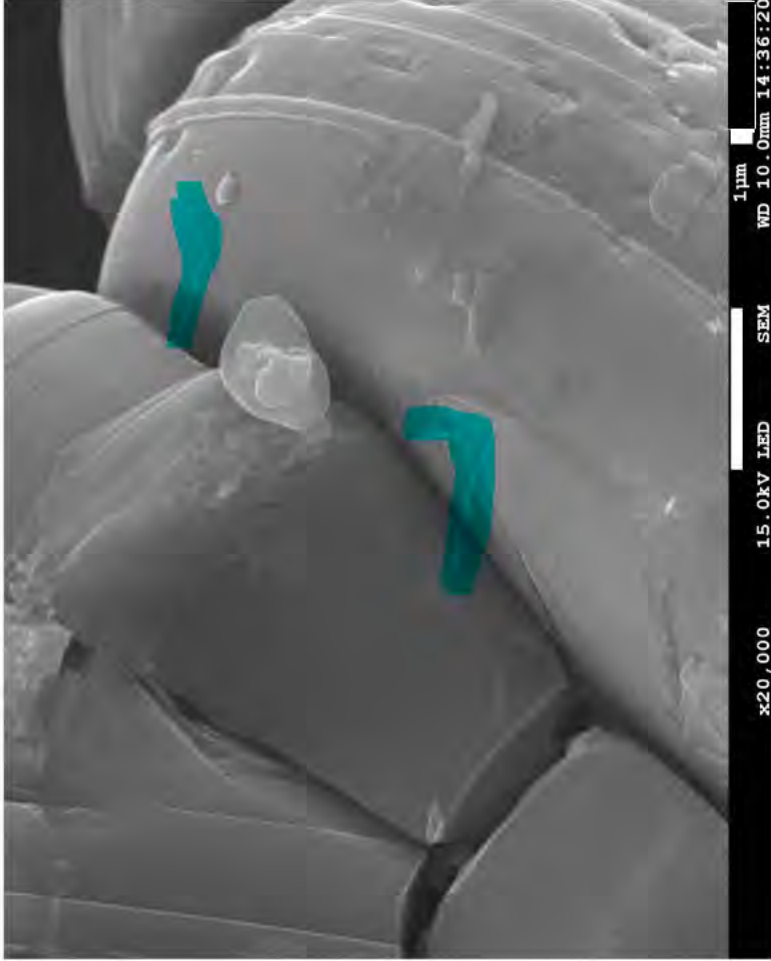
Claim	Contention
	Further, said materials comprise crystals of lithium-ion active material, including crystals comprised of NCM, NCA, LCO, and/or LFP. This is demonstrated by the below images relating to certain representative '483 Accused Products, which reflects that HG2 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 400-500 nm (nanoscale) in diameter. 

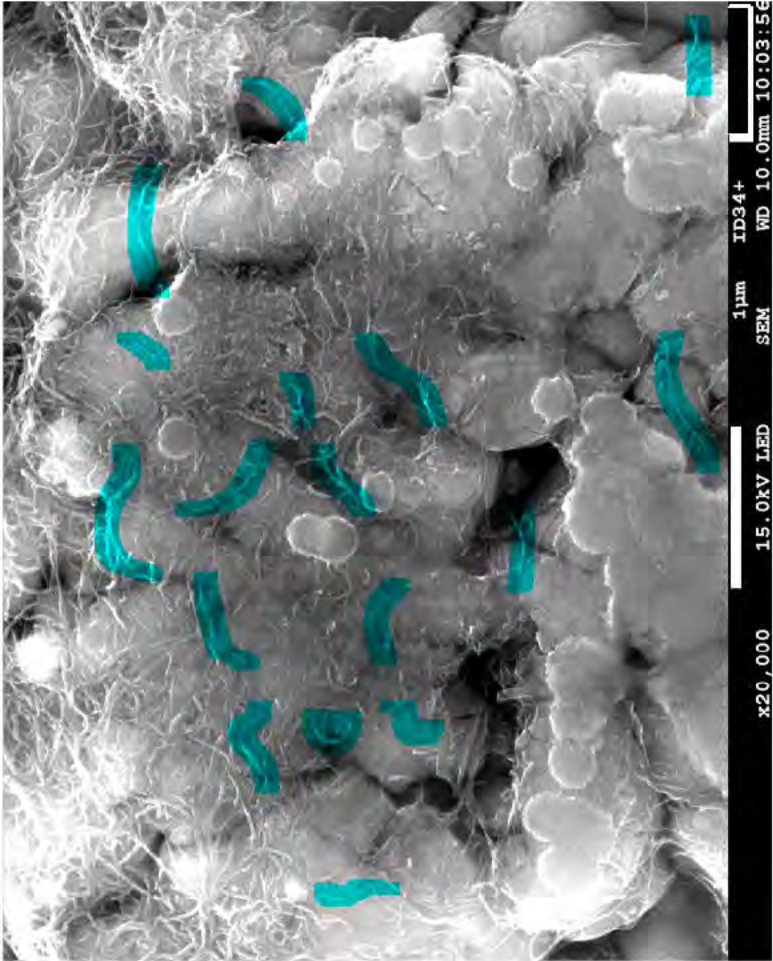
As another example, as depicted below, HG6 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200–400 nm (nanoscale) in diameter.

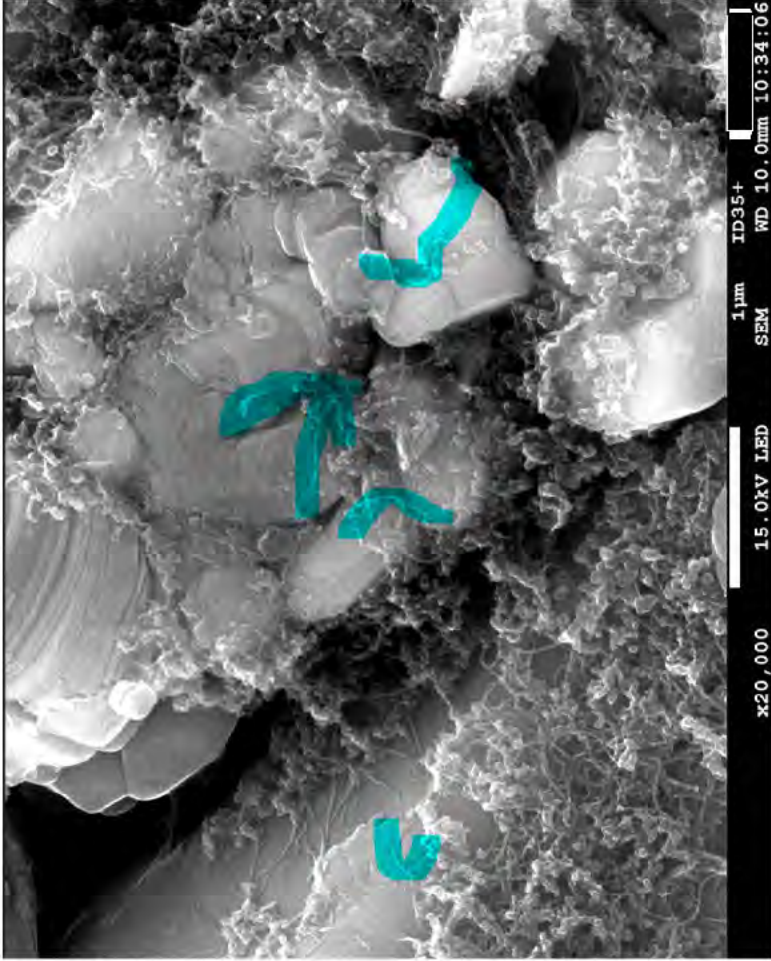


Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter.  The image is a scanning electron micrograph (SEM) showing a surface with numerous small, rounded, and somewhat irregular features, which are the nickel cobalt manganese (NCM) active material crystals. Several of these crystals are highlighted with blue outlines, indicating the presence of discrete nanotubes attached to their surfaces. The nanotubes appear as thin, elongated structures extending from the crystals. The background is a textured, granular surface. Technical data at the bottom of the image includes: x20,000 magnification, 5.0kV voltage, LED, SEM, 1µm scale bar, ID3CATH, WD 10.0mm, and a timestamp of 09:37:56.

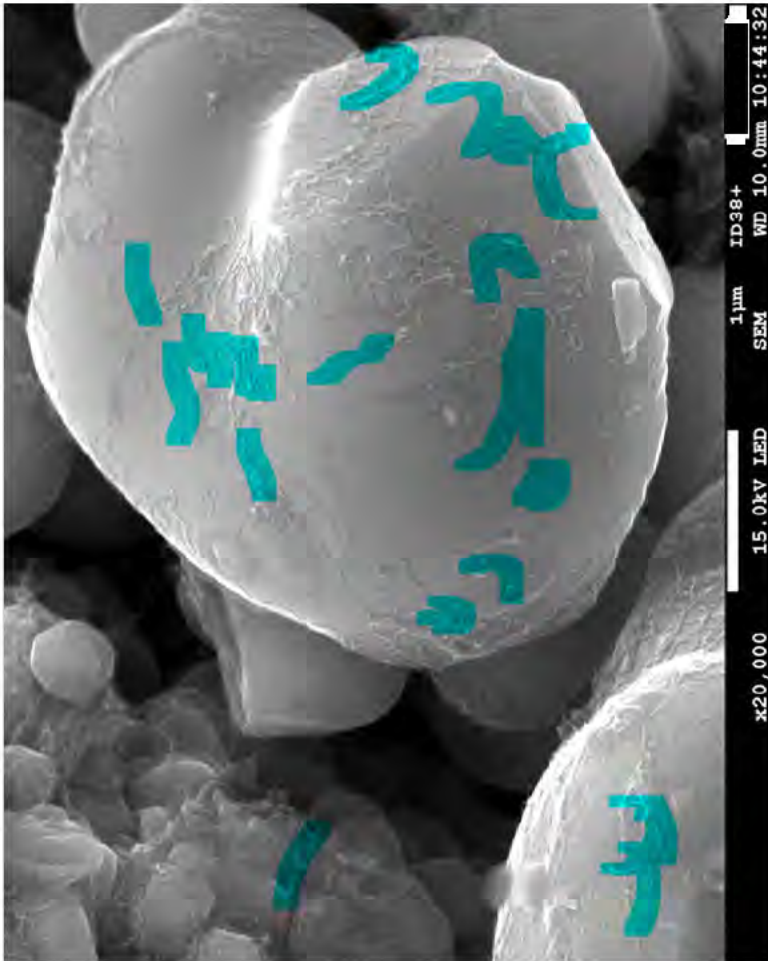
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
Infringement of U.S. Patent No. 10,153,483

Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter.  The SEM image shows a surface with several large, irregular, light-colored crystals. Two small, dark, cylindrical nanotubes are highlighted with blue rectangular boxes. The nanotubes are positioned on the surface of the crystals. The image includes a scale bar indicating 1 μm, and technical parameters: x20,000, 15.0kV, LED, SEM, WD 10.0mm, 14:36:20.

Claim	Contention
	As another example, as depicted below, E78 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

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Claim	Contention
	As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals. 
wherein a ratio of lithium ion to other total ions in the ion active materials is at least 2:1,	This element is met by the '483 Accused Products, each of which comprises mixtures of ion active materials "wherein a ratio of lithium ion to other total ions in the ion active materials is at least 2:1 to 25:1." For example, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Further, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable

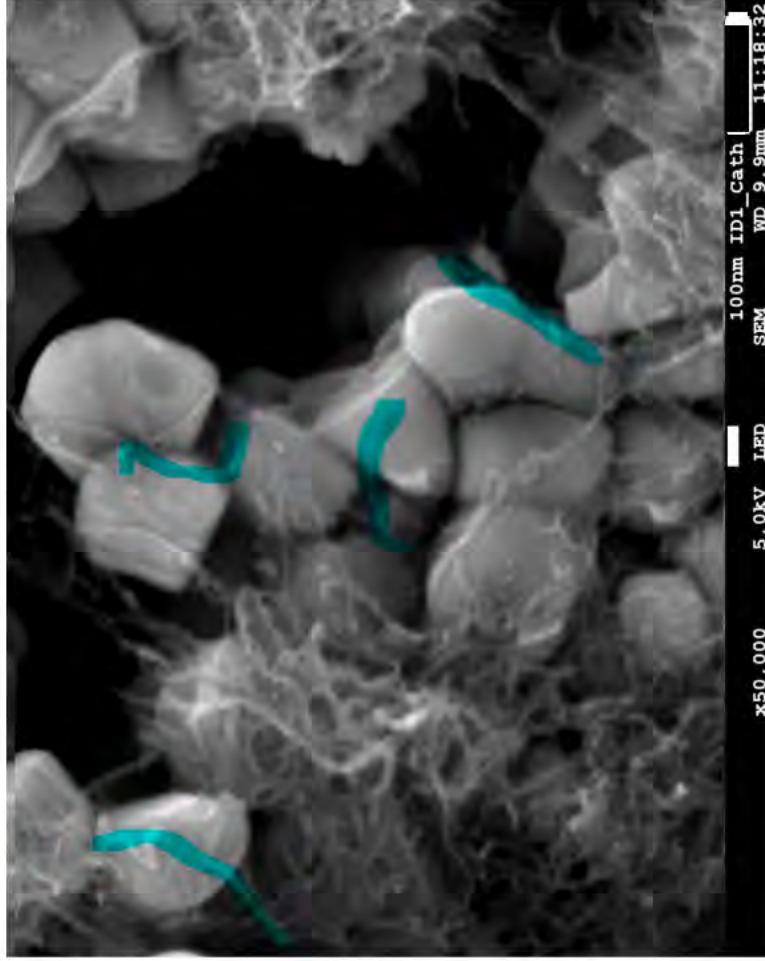
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)

Infringement of U.S. Patent No. 10,153,483

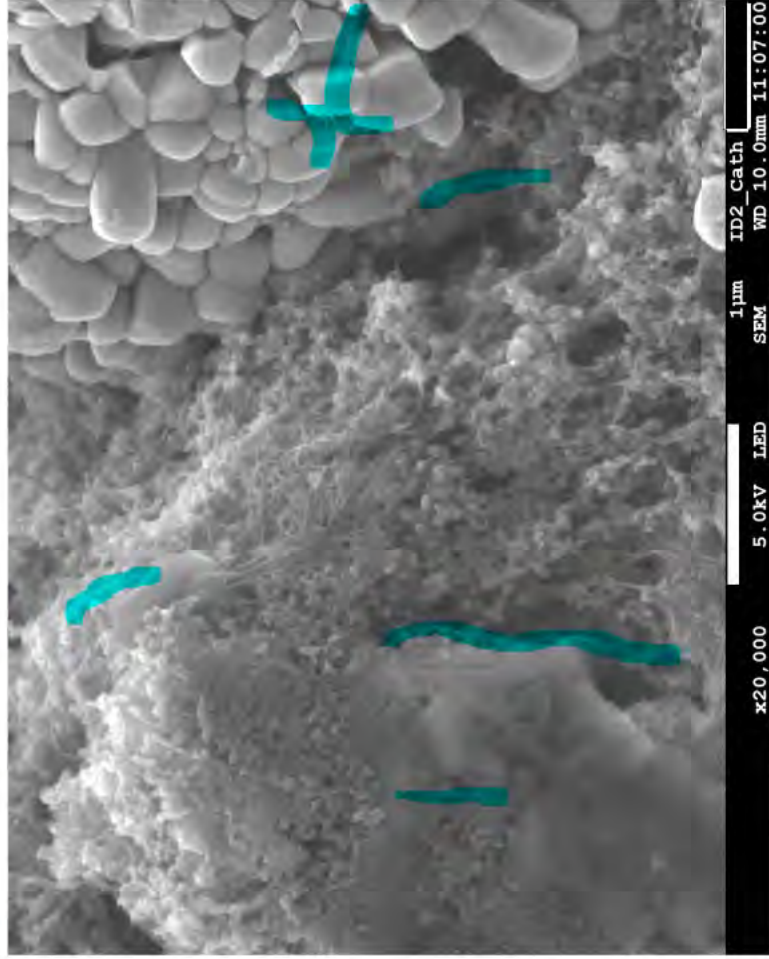
Claim		Contention
		nature of the Li ⁺ , its concentration within the cathode varies during charge and discharge processes but is configured to be within a 2:1 to 25:1 ratio at least when at approximately a 44% to 98% state of charge.
	and wherein discrete carbon nanotubes have crystals or layers of lithium ion active material ionically attached to their surface	This element is met by the '483 Accused Products, each of which comprises "discrete carbon nanotubes have crystals or layers of lithium ion active material ionically attached to their surface." Specifically, each of the '483 Accused Products comprises discrete carbon nanotubes have crystals of lithium ion active material ionically attached to their surface.

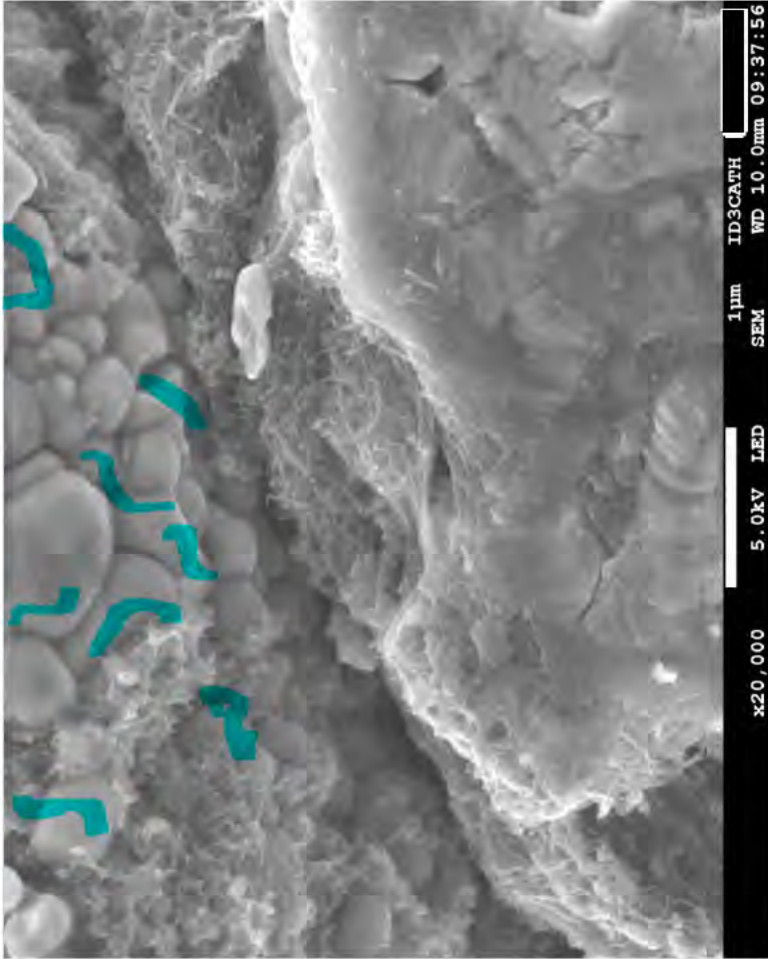
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
Infringement of U.S. Patent No. 10,153,483

This is demonstrated by the below images relating to certain representative '483 Accused Products, which reflects that HG2 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 400-500 nm (nanoscale) in diameter.

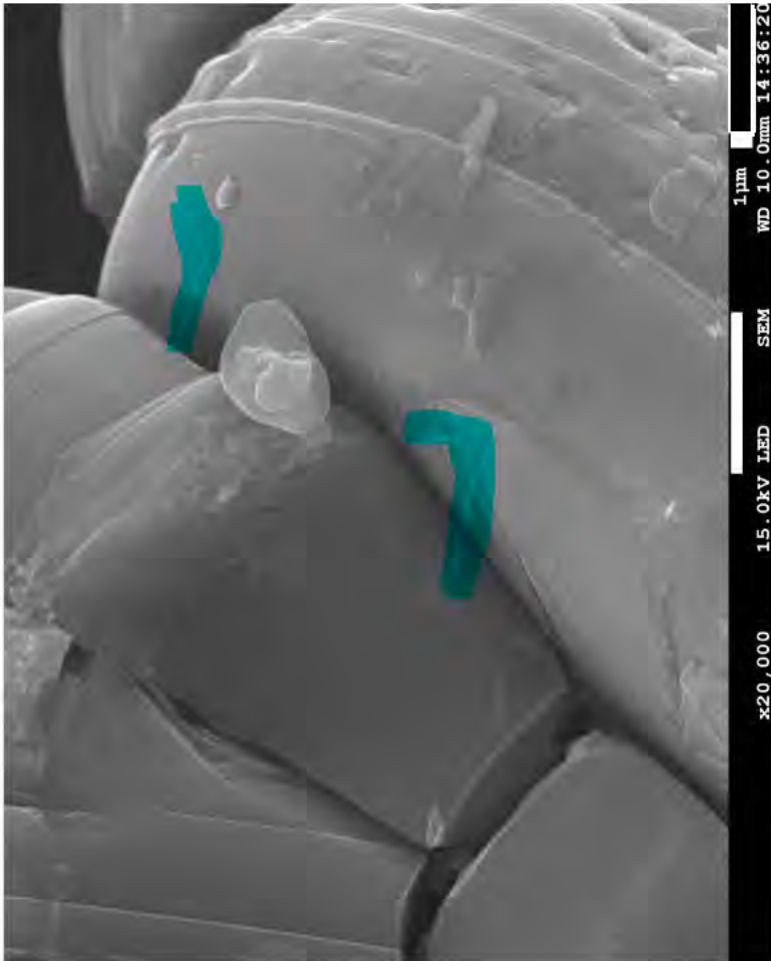


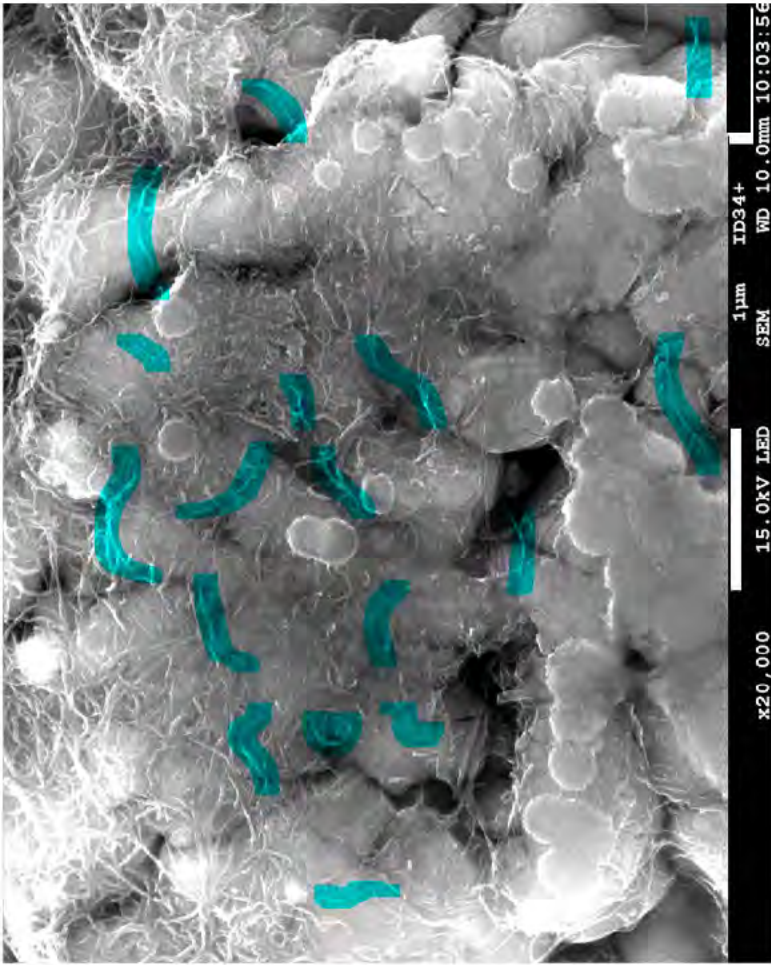
As another example, as depicted below, HG6 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200–400 nm (nanoscale) in diameter.

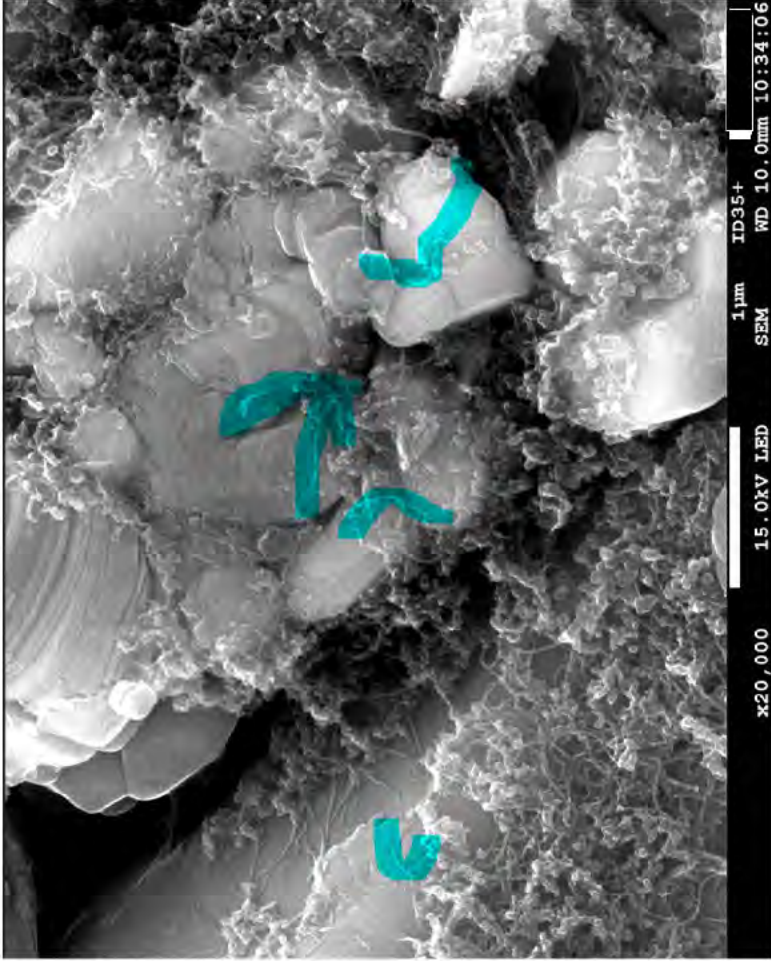


Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter.  The image is a scanning electron micrograph (SEM) showing a surface with numerous small, rounded, and somewhat irregular features, which are the nickel cobalt manganese (NCM) active material crystals. Several of these crystals are connected by thin, elongated, and somewhat curved structures, which are the discrete nanotubes. These nanotubes are highlighted in blue. The background is a textured, granular surface. The image includes a scale bar indicating 1 μm and technical parameters: x20,000, 5.0kV, LED, SEM, ID3CATH, WD 10.0mm, 09:37:56.

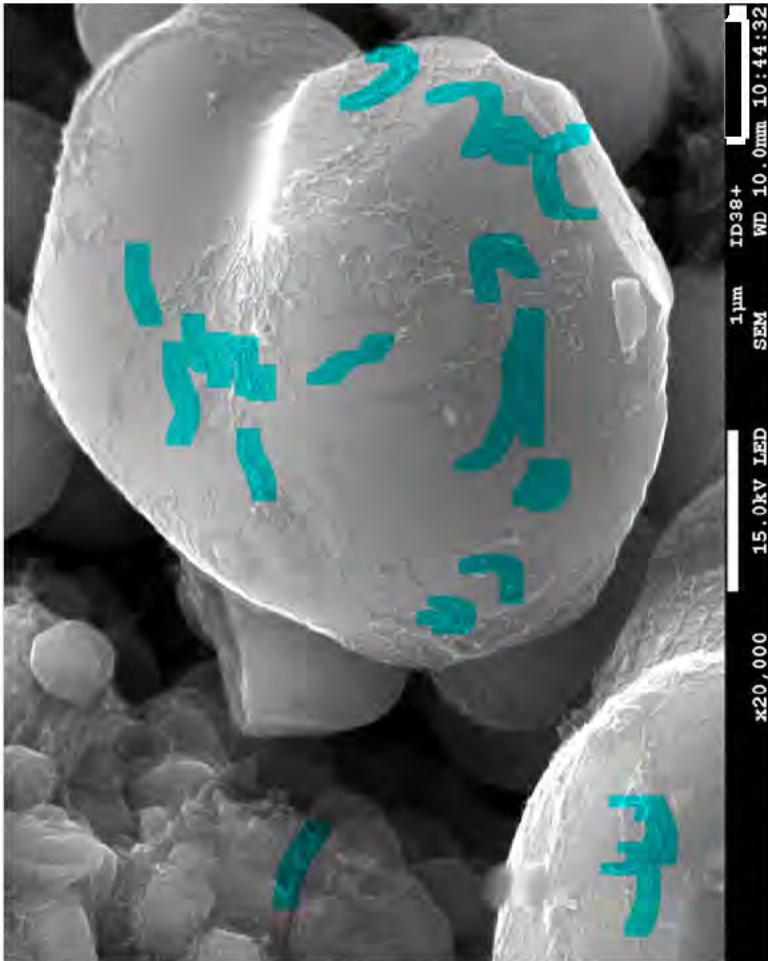
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
Infringement of U.S. Patent No. 10,153,483

Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter.  The SEM image shows a surface with several large, irregular, light-colored crystals. Two small, dark, cylindrical nanotubes are highlighted with blue rectangular boxes. The nanotubes are positioned on the surface of the crystals. The image includes a scale bar in the bottom right corner indicating 1 μm, and technical parameters: x20,000, 15.0kV, LED, SEM, WD 10.0mm, 14:36:20.

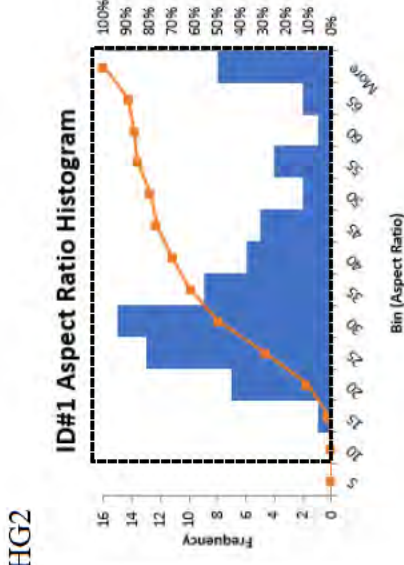
Claim	Contention
	As another example, as depicted below, E78 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

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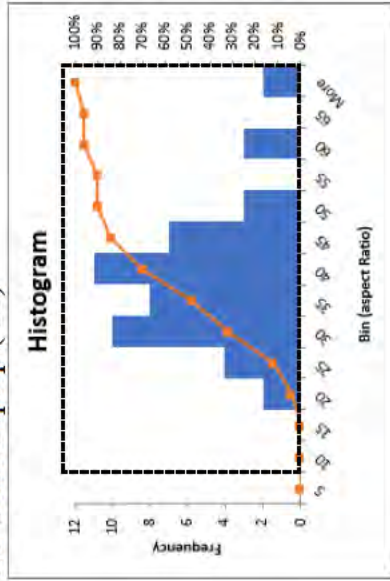
Claim	Contention
	As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals. 
and wherein the discrete carbon nanotubes comprise oxidized species selected from the group consisting of	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes "wherein the discrete carbon nanotubes comprise oxidized species selected from the group consisting of carboxylic, ketone, or hydroxyl functionalities." Specifically, each of the '483 Accused Products include discrete carbon nanotubes that comprise carboxylic, ketone, and/or hydroxyl functionalities.

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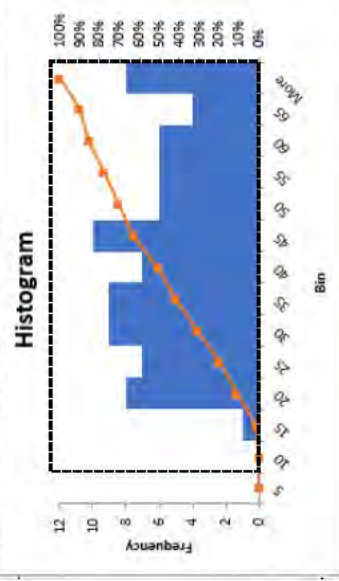
Claim	Contention																																																
carboxylic, ketone, or hydroxyl functionalities,																																																	
and wherein the discrete carbon nanotubes have an aspect ratio of 10 to 500	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes "wherein the discrete carbon nanotubes have an aspect ratio of 10 to 500." Specifically, each of the '483 Accused Products comprises carbon nanotubes having an aspect ratio of between 10 to 500 when its length is divided by its diameter. This is demonstrated by the below images relating to certain representative '483 Accused Products, which reflects that the '483 Accused Products comprise discrete nanotubes with an aspect ratio typically between 10 and 100:																																																
HG2	 The histogram, titled "ID#1 Aspect Ratio Histogram", displays the frequency of aspect ratios. The x-axis is labeled "Bin (Aspect Ratio)" and ranges from 5 to 100. The y-axis is labeled "Frequency" and ranges from 0 to 16. The histogram bars are blue, and an orange line with markers represents the cumulative distribution curve. The curve starts at 0 for a bin of 5 and rises to approximately 95% for a bin of 100. <table><caption>Approximate data from ID#1 Aspect Ratio Histogram</caption><thead><tr><th>Bin (Aspect Ratio)</th><th>Frequency</th><th>Cumulative %</th></tr></thead><tbody><tr><td>5</td><td>1</td><td>~1%</td></tr><tr><td>10</td><td>2</td><td>~3%</td></tr><tr><td>15</td><td>3</td><td>~6%</td></tr><tr><td>20</td><td>4</td><td>~10%</td></tr><tr><td>25</td><td>5</td><td>~15%</td></tr><tr><td>30</td><td>6</td><td>~21%</td></tr><tr><td>35</td><td>7</td><td>~28%</td></tr><tr><td>40</td><td>8</td><td>~36%</td></tr><tr><td>45</td><td>9</td><td>~45%</td></tr><tr><td>50</td><td>10</td><td>~55%</td></tr><tr><td>55</td><td>11</td><td>~66%</td></tr><tr><td>60</td><td>12</td><td>~78%</td></tr><tr><td>65</td><td>13</td><td>~90%</td></tr><tr><td>70</td><td>14</td><td>~98%</td></tr><tr><td>75</td><td>15</td><td>~100%</td></tr></tbody></table>	Bin (Aspect Ratio)	Frequency	Cumulative %	5	1	~1%	10	2	~3%	15	3	~6%	20	4	~10%	25	5	~15%	30	6	~21%	35	7	~28%	40	8	~36%	45	9	~45%	50	10	~55%	55	11	~66%	60	12	~78%	65	13	~90%	70	14	~98%	75	15	~100%
Bin (Aspect Ratio)	Frequency	Cumulative %																																															
5	1	~1%																																															
10	2	~3%																																															
15	3	~6%																																															
20	4	~10%																																															
25	5	~15%																																															
30	6	~21%																																															
35	7	~28%																																															
40	8	~36%																																															
45	9	~45%																																															
50	10	~55%																																															
55	11	~66%																																															
60	12	~78%																																															
65	13	~90%																																															
70	14	~98%																																															
75	15	~100%																																															

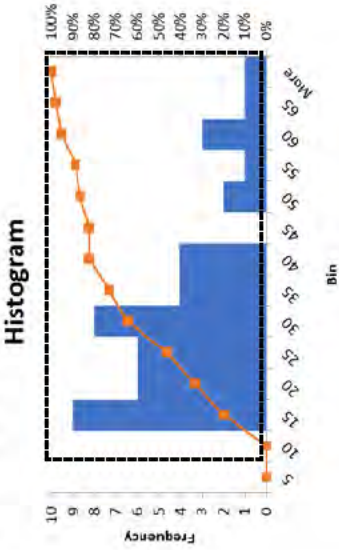
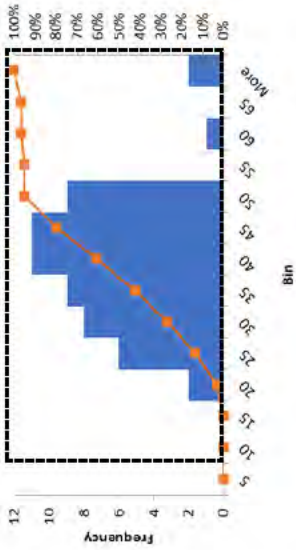
Claim	Contention
HG6 ID#2 Aspect Ratio Histogram This histogram shows the frequency distribution of aspect ratios for ID#2. The x-axis is labeled 'Bin (Aspect Ratio)' and ranges from 1 to 10. The y-axis is labeled 'Frequency' and ranges from 0 to 14. The bars are blue, and an orange line with markers is overlaid, showing a peak at bin 5 and a secondary peak at bin 8. The cumulative percentage is shown on the right y-axis, ranging from 0% to 100%. MJ1 ID#3 Aspect Ratio Histogram This histogram shows the frequency distribution of aspect ratios for ID#3. The x-axis is labeled 'Bin (Aspect Ratio)' and ranges from 1 to 10. The y-axis is labeled 'Frequency' and ranges from 0 to 16. The bars are blue, and an orange line with markers is overlaid, showing a peak at bin 5 and a secondary peak at bin 8. The cumulative percentage is shown on the right y-axis, ranging from 0% to 100%.	

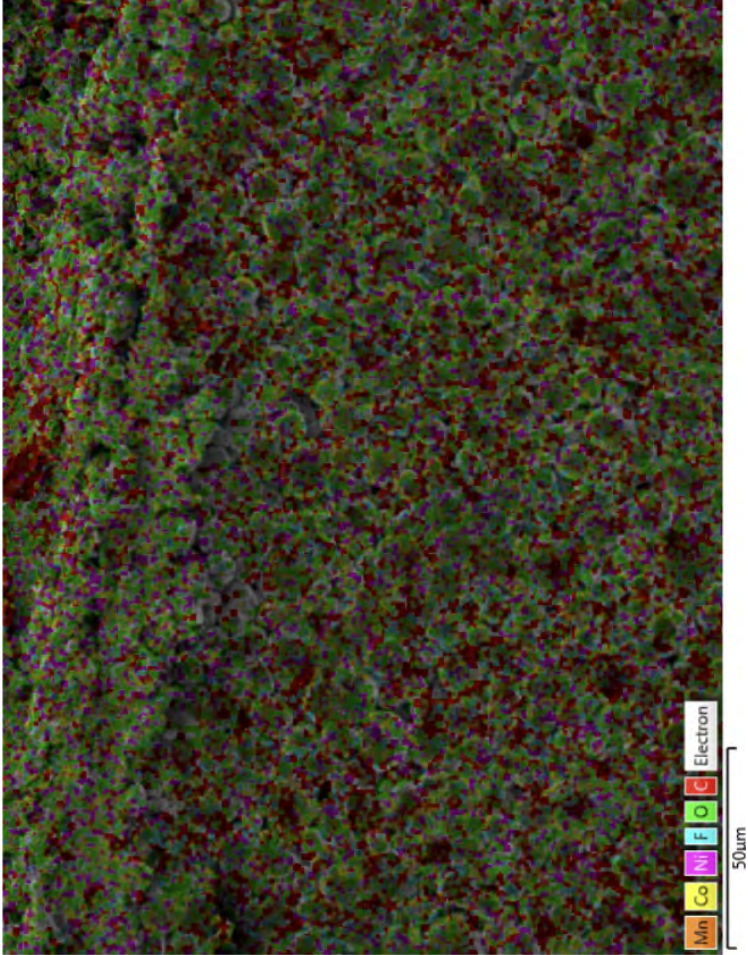
LG Gram Laptop ('22)



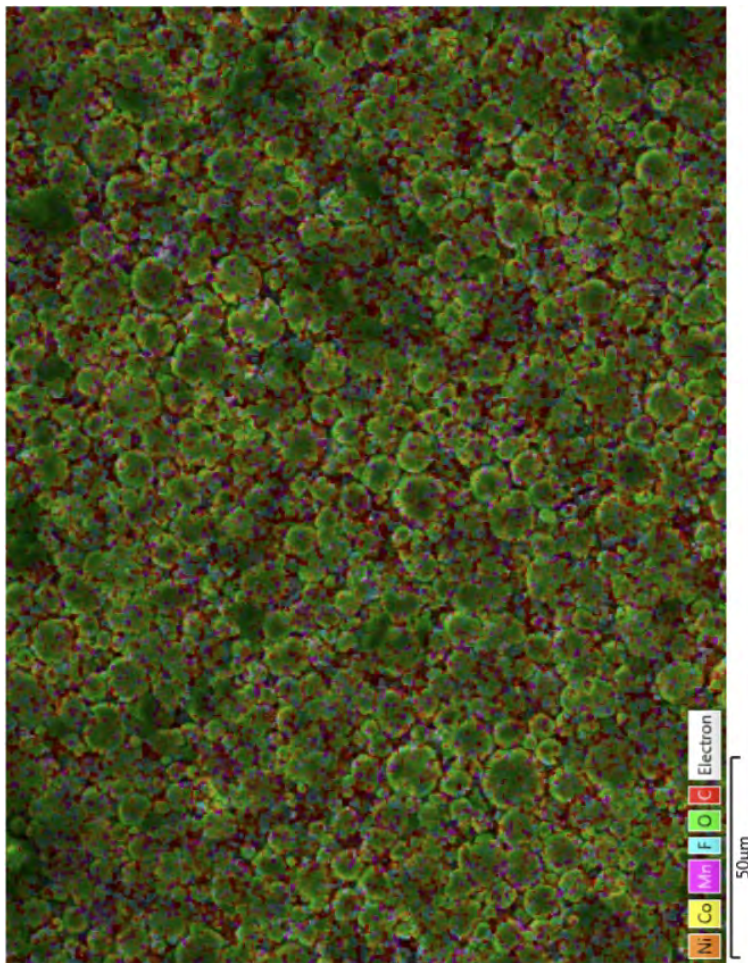
LG E78 eVehicle/ESS Pouch:

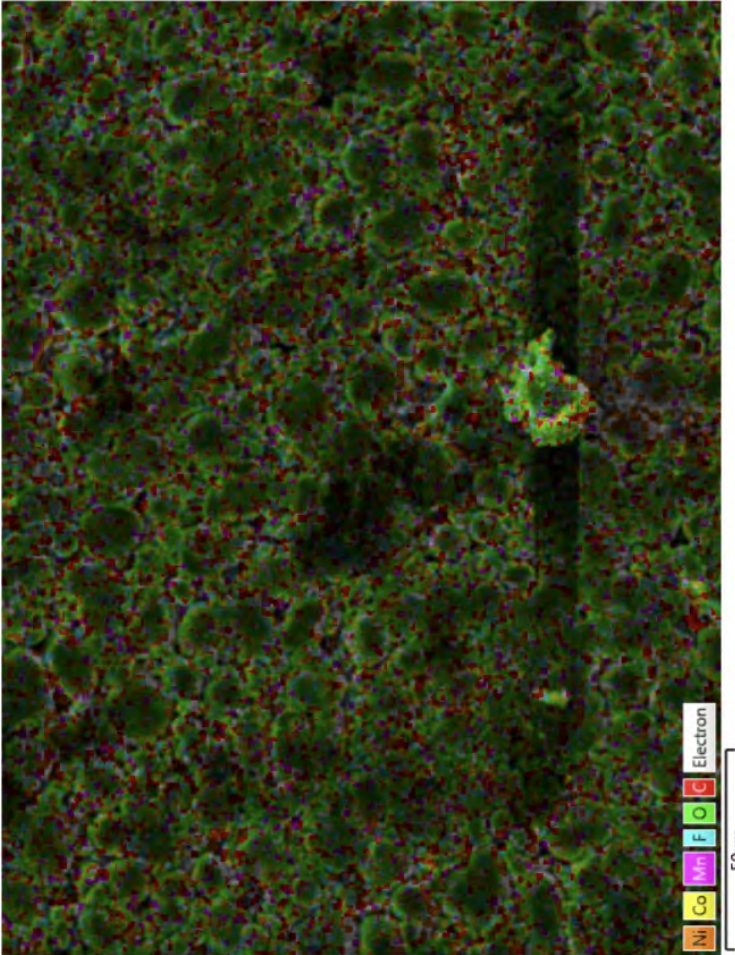


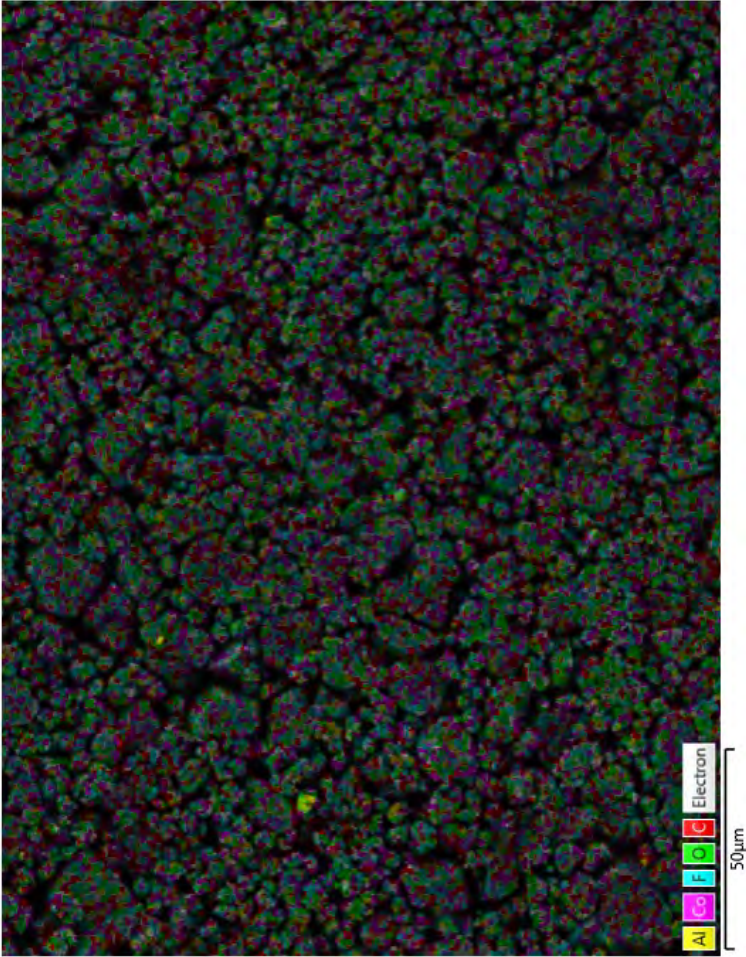
Claim	Contention
	LG Gram Laptop ('19):  LG G8 Cellphone Battery ('19): 
and oxidation levels from 1% to 15% by weight of the carbon nanotube.	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes "wherein the discrete carbon nanotubes have ... oxidation levels from 1% to 15% by weight of the carbon nanotube." Specifically, each of the '483 Accused Products comprises carbon nanotubes having oxidation levels not exceeding 15% by weight of the carbon nanotube, with the majority having oxidation levels of approximately 1% to 3% by weight of the carbon nanotube.

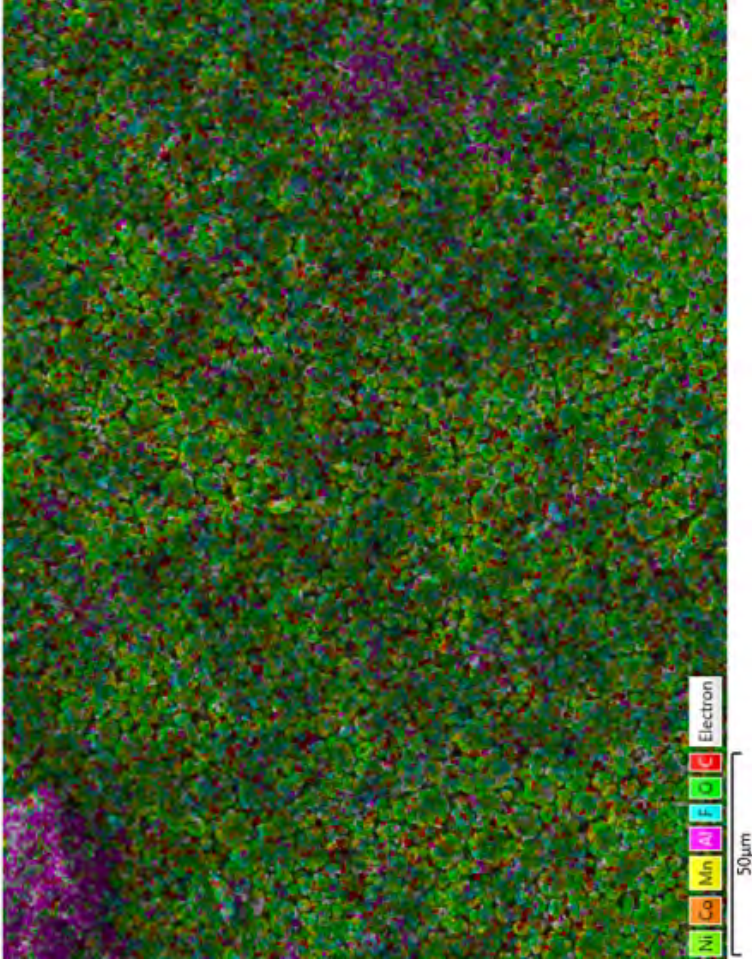
Claim		Contention
		This is demonstrated in part by the below, which reflects the presence of oxygen in each sample. HG2  The image is an EDS spectrum showing peaks for Mn, Co, Ni, F, O, C, and Electron. A scale bar indicates 50um.

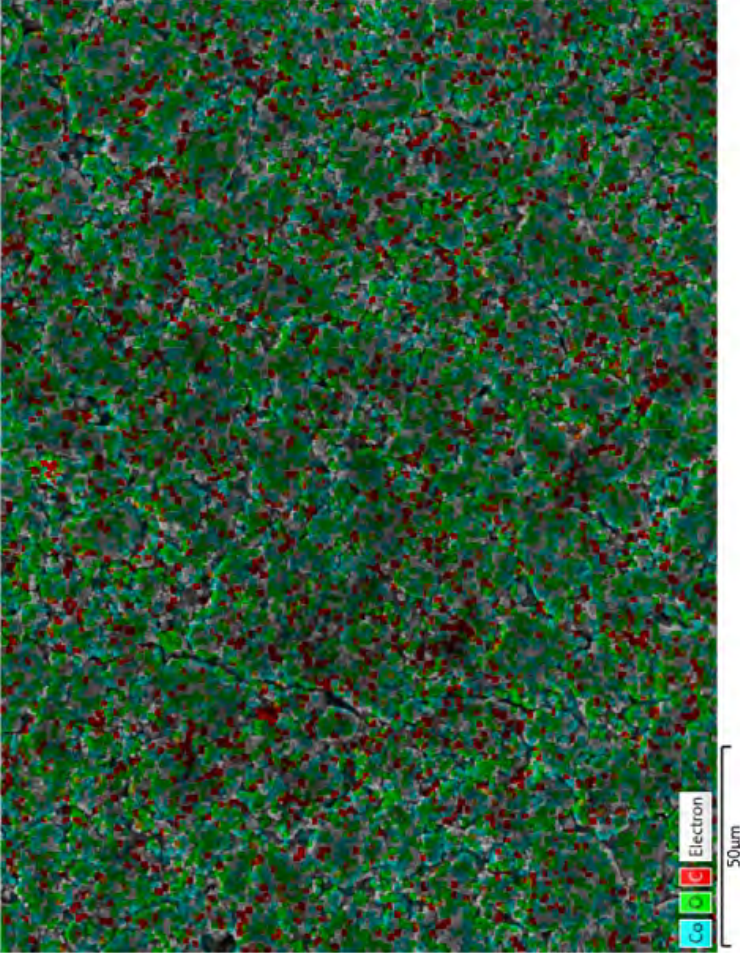
HG6



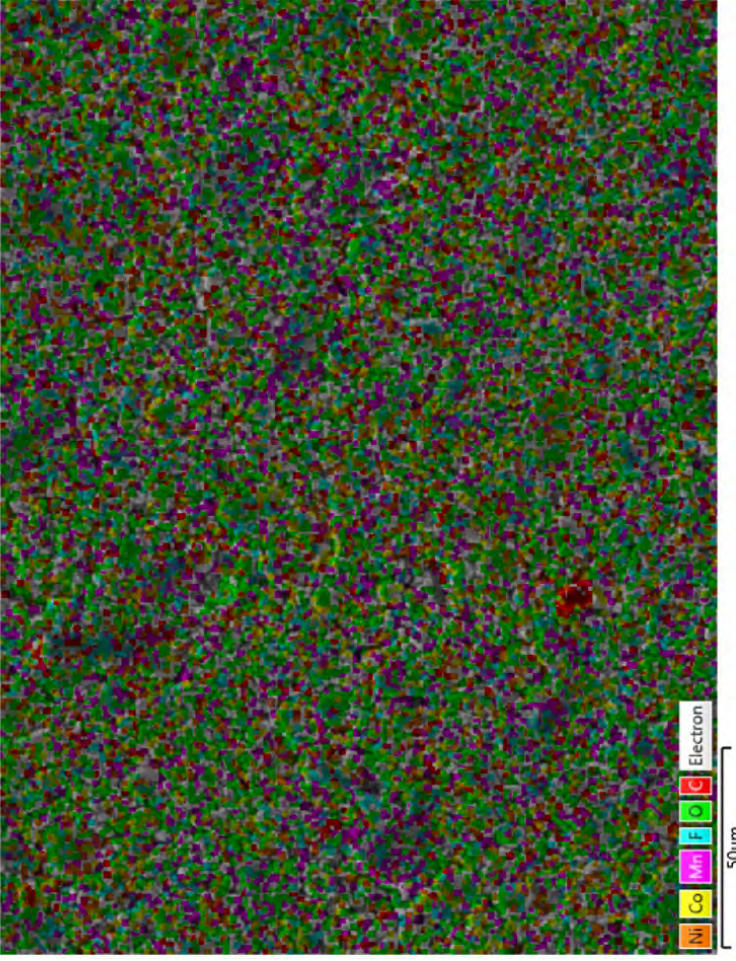
Claim		Contention
		MJ1 

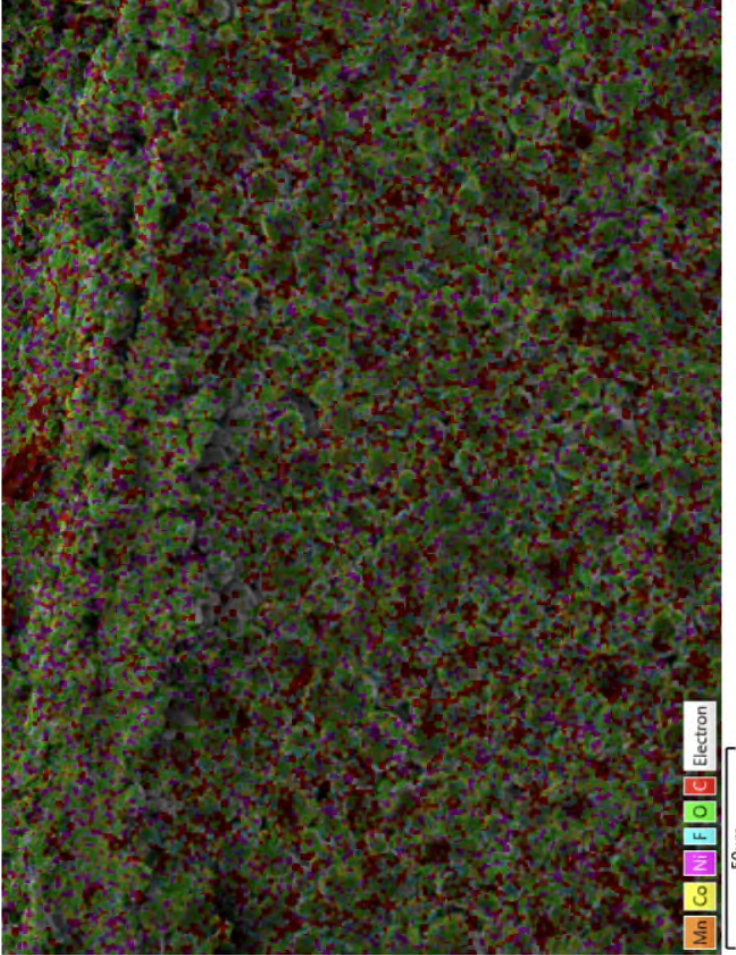
Claim		Contention
		LG Gram Laptop ('22): EDS Layered Image 1  50µm

Claim		Contention
		LG E78 eVehicle/ESS Pouch: EDS Layered Image 2  The image is a cross-sectional view of a material, likely a battery pouch, showing a granular, textured surface. The colors represent different elements: Ni (blue), Co (orange), Mn (yellow), F (green), C (red), and Electron (purple). A scale bar at the bottom right indicates 50µm.

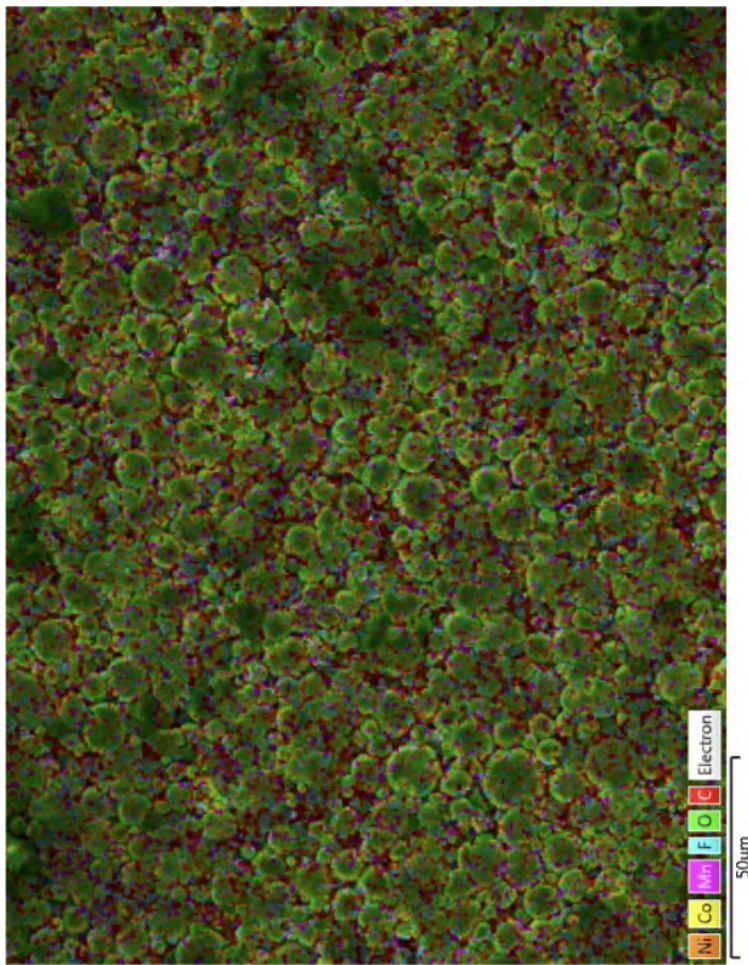
Claim		Contention
		LG Gram Laptop ('19): EDS Layered Image 3  The image is an EDS Layered Image 3 showing a microscopic view of a material surface. The surface is covered with a dense, granular texture. The colors represent different elements: Carbon (C) in red, Oxygen (O) in green, and Silicon (Si) in blue. A scale bar in the bottom right corner indicates a length of 50µm. The legend shows C, O, Si, and Electron.

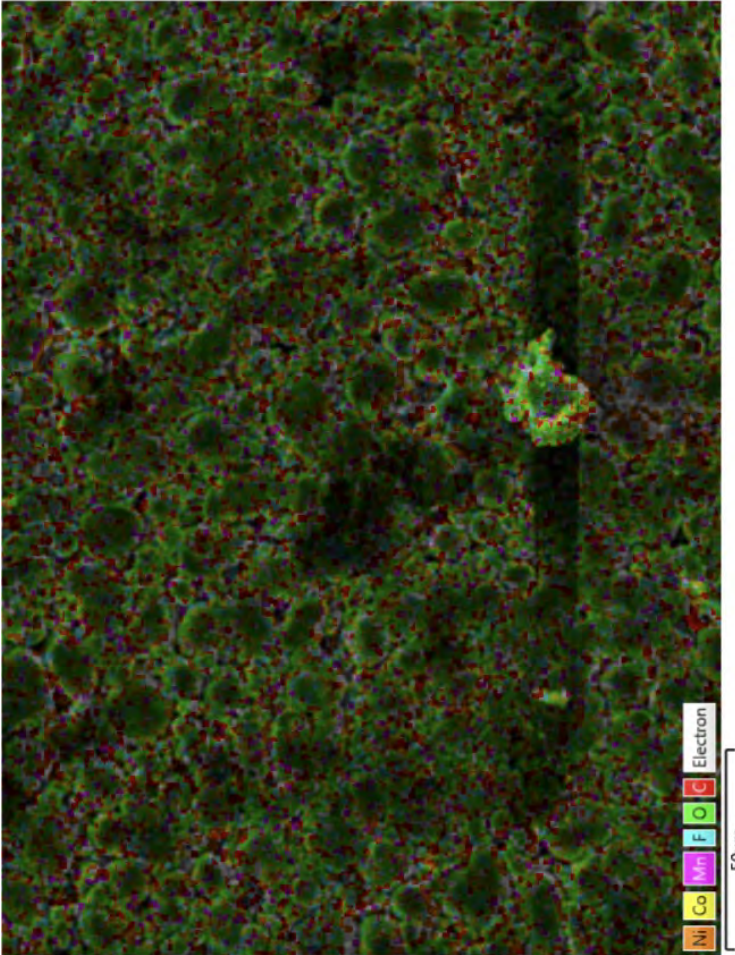
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
Infringement of U.S. Patent No. 10,153,483

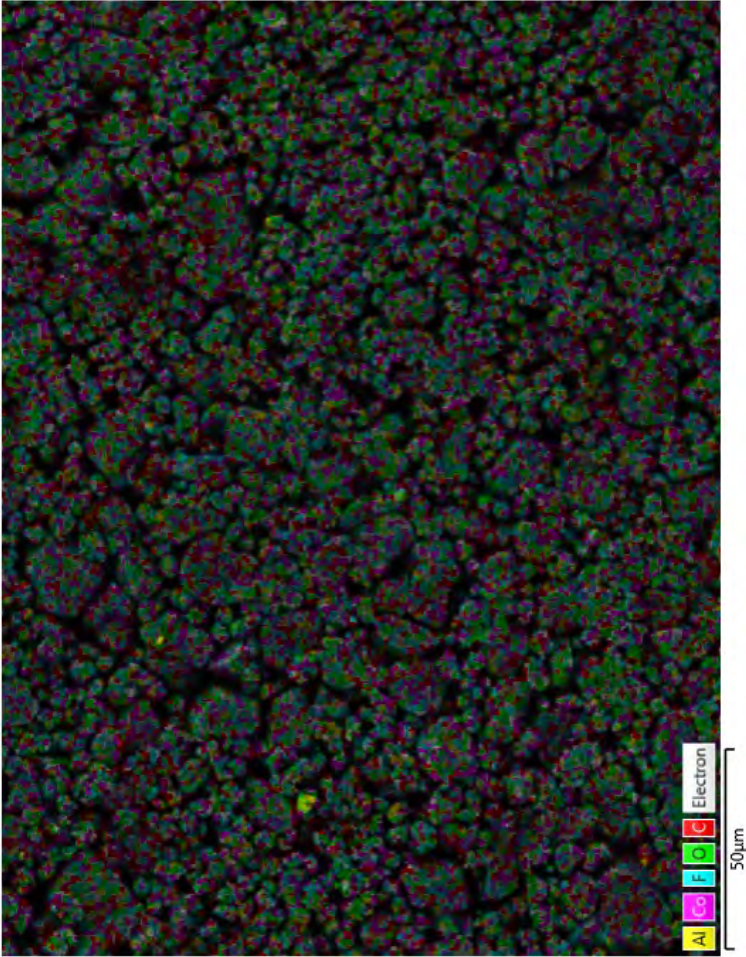
Claim	Contention
	LG G8 Cellphone Battery ('19):  EDS Layered Image 1
2	The composition of claim 1, wherein the crystals or layers of lithium ion active material comprise a lithium metal salt and an element selected from the group consisting of: iron, manganese, cobalt, copper, nickel, vanadium, titanium, and mixtures thereof.” This element is met by the '483 Accused Products, each of which comprises “[t]he composition of claim 1, wherein the crystals or layers of lithium ion active material comprise a lithium metal salt and an element selected from the group consisting of: iron, manganese, cobalt, copper, nickel, vanadium, titanium, and mixtures thereof.” As detailed above, each of the '483 Accused Products comprises “[t]he composition of claim 1.” Further, each of the '483 Accused Products comprises a lithium metal oxide salt that ionically pairs, coordinates, or intercalates with Li⁺.

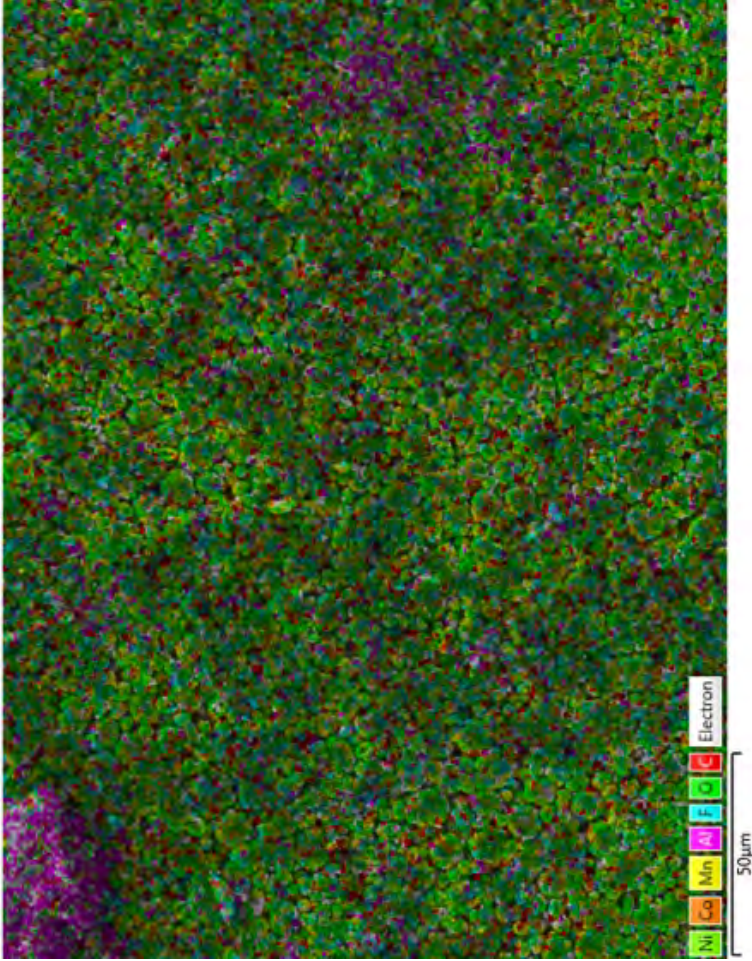
Claim		Contention
copper, nickel, vanadium, titanium, and mixtures thereof.		In addition , each of the '483 Accused Products comprises Manganese, Cobalt, and Nickel or simply Cobalt Oxide. This is demonstrated in part by the below, which the presence of such materials in the representative samples.
	HG2	

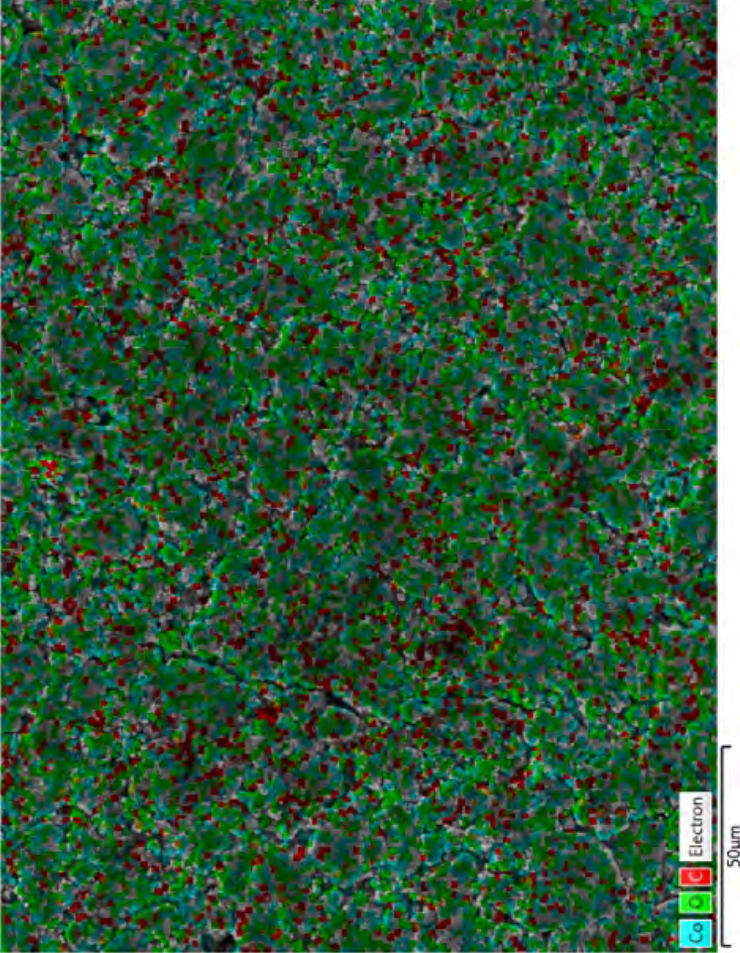
HG6



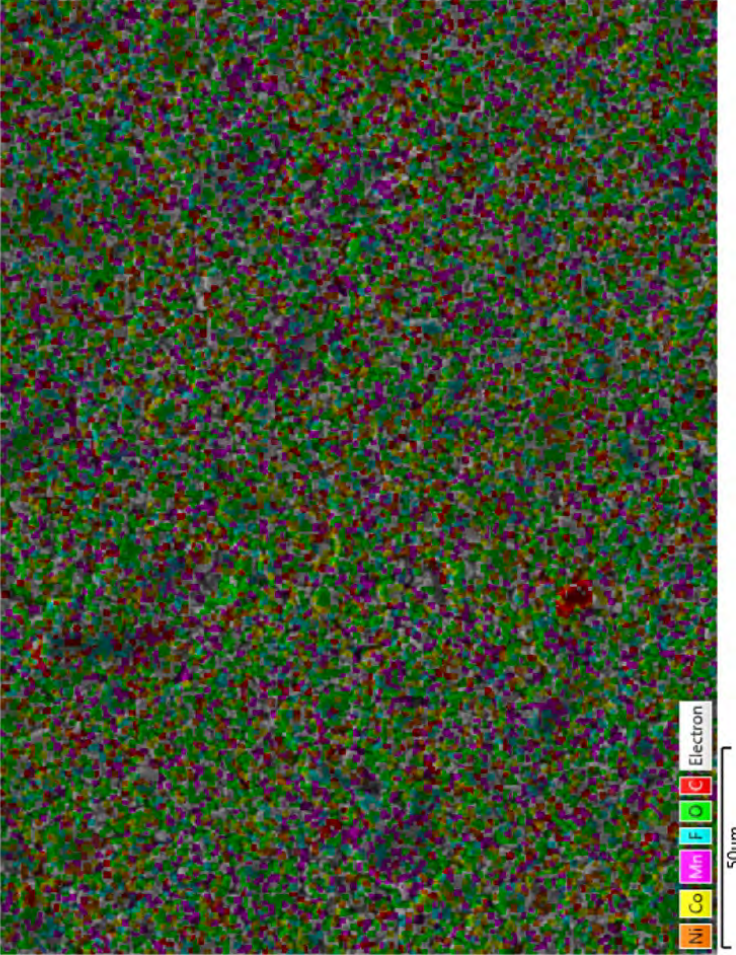
Claim		Contention
		MJ1 

Claim		Contention
		LG Gram Laptop ('22): EDS Layered Image 1  50µm

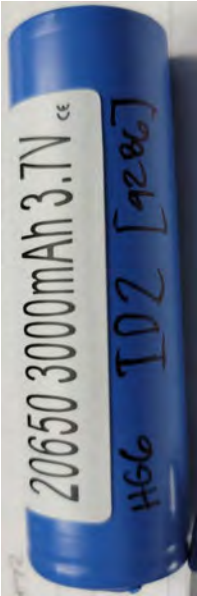
Claim		Contention
		LG E78 eVehicle/ESS Pouch: EDS Layered Image 2 

Claim		Contention
		LG Gram Laptop ('19): EDS Layered Image 3  The image is an EDS Layered Image 3, which is a composite of elemental maps. It shows a dense, granular surface with a mix of colors representing different elements: blue for Carbon (C), red for Oxygen (O), and green for Silicon (Si). A scale bar in the bottom right corner indicates a length of 50µm. The legend at the bottom right shows the color coding: C (blue), O (red), Si (green), and Electron (white).

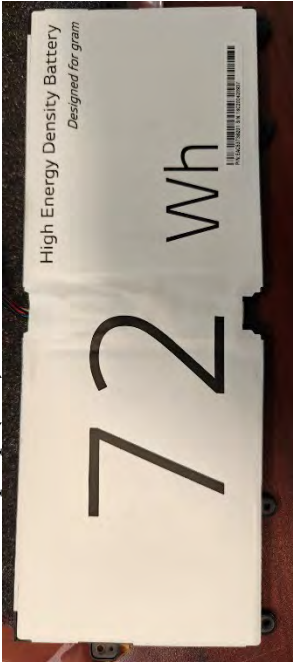
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
Infringement of U.S. Patent No. 10,153,483

Claim	Contention
	LG G8 Cellphone Battery ('19):  EDS Layered Image 1
7 A composition useful for lithium-ion batteries comprising:	To the extent that the preamble is limiting, it is met by the '483 Accused Products, each of which comprises "[a] composition useful for lithium-ion batteries." Specifically, each of the '483 Accused Products is a battery that comprises lithium-ion cells and/or pouches. For example, LG has stated that "the two most widely used mixtures are NCM (<u>Li</u>, O, Ni, Co, Mn) and NCA (<u>Li</u>, Ni, Co, Al, O)." https://blog.lgchem.com/en/2023/05/31_cathode_material/. Further, LG also utilizes a mixture comprised of LCO (<u>Li</u>, Co, O) and LFP (<u>Li</u>, Iron, Phosphate). Examples of such batteries are depicted below. LG HG2:

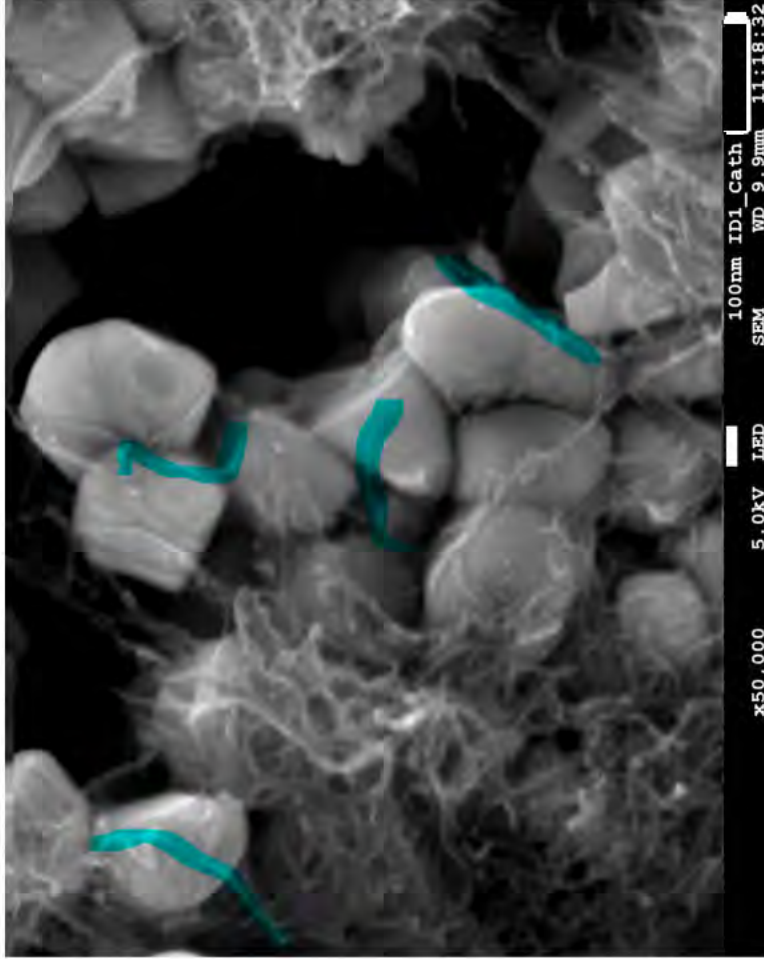
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

Claim	Contention
	 LG HG6:  LG MJ1:  LG Gram Laptop ('22):  LG E78 eVehicle/ESS Pouch:

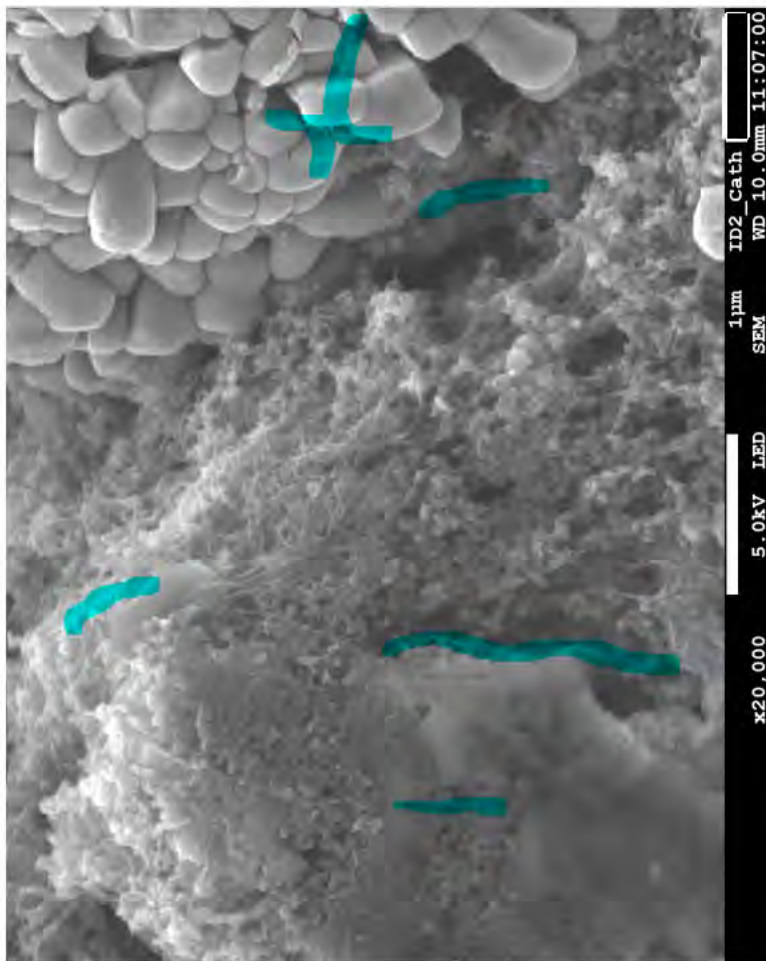
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

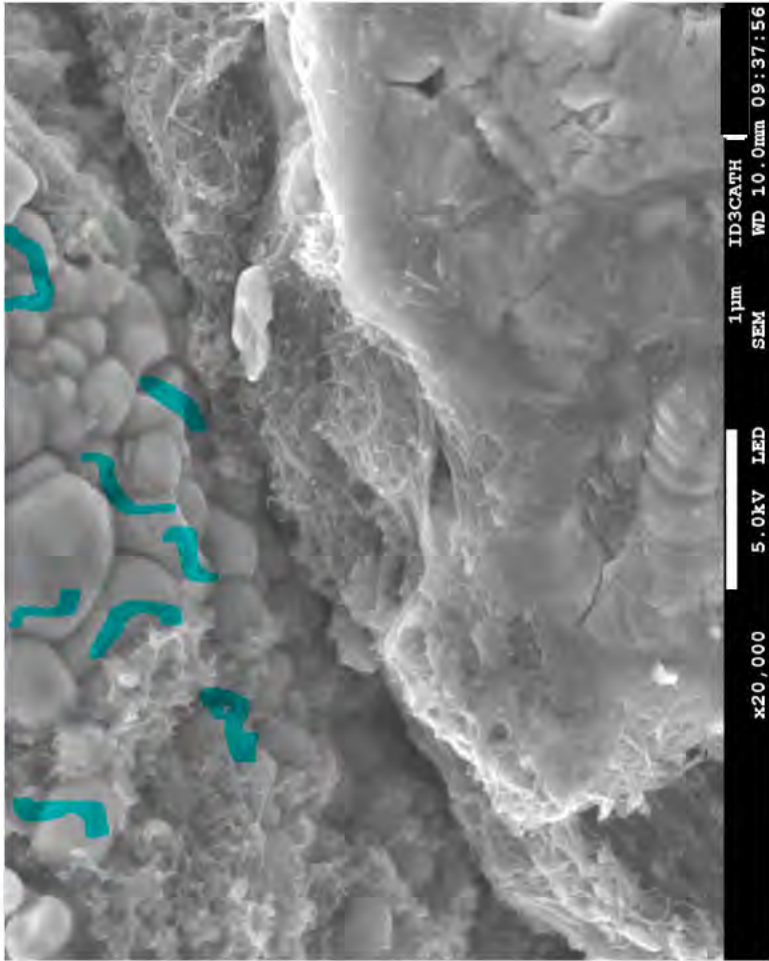
Claim	Contention
	 LG Gram Laptop ('19):  LG G8 Cellphone Battery ('19): 
discrete, non-agglomerated, and exfoliated carbon nanotubes having a surface,	This element is met by the '483 Accused Products, each of which comprises “discrete, non-agglomerated, and exfoliated carbon nanotubes having a surface.” Specifically, each of the '483 Accused Products comprises discrete, non-agglomerated, and exfoliated carbon nanotubes that have at least one surface.

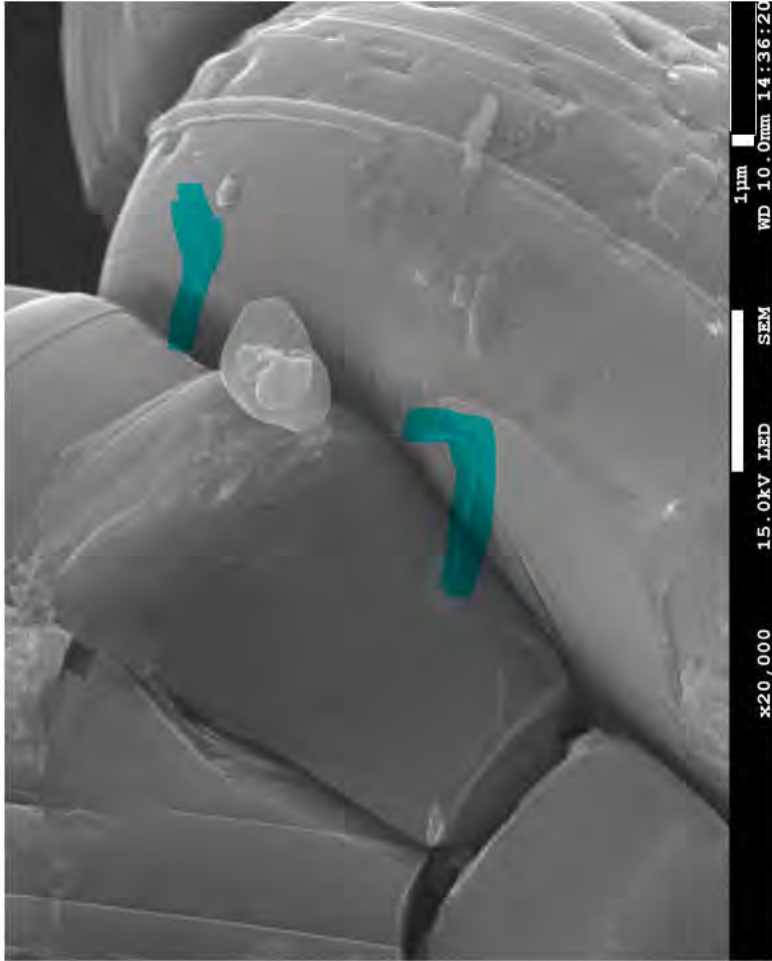
This is demonstrated by the below, which reflects that HG2 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface.

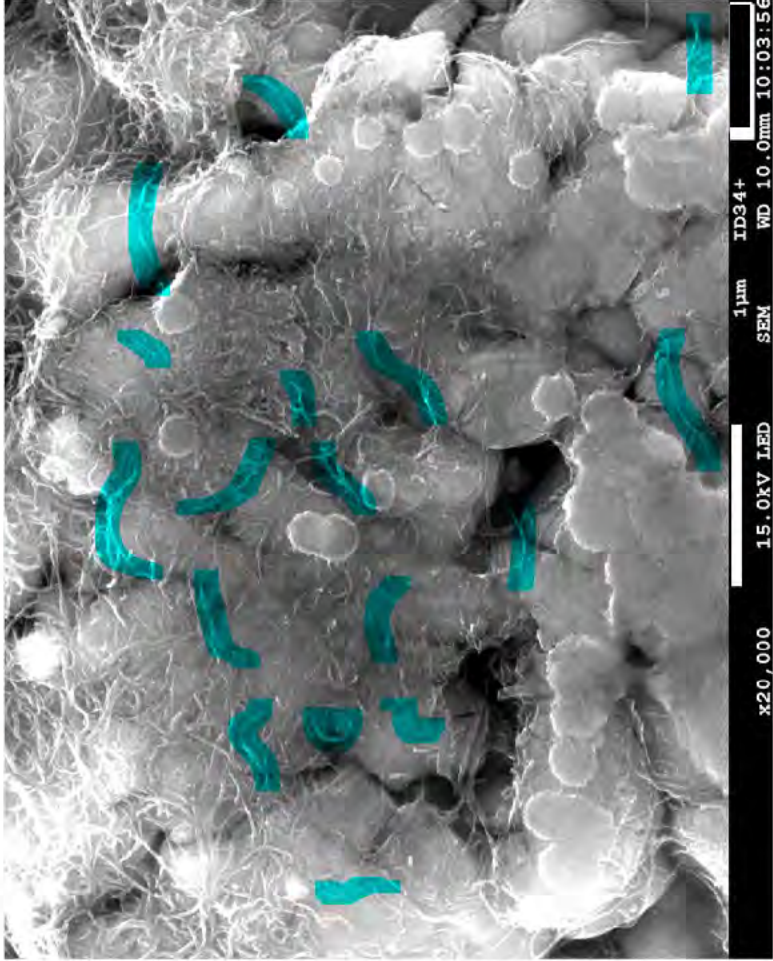


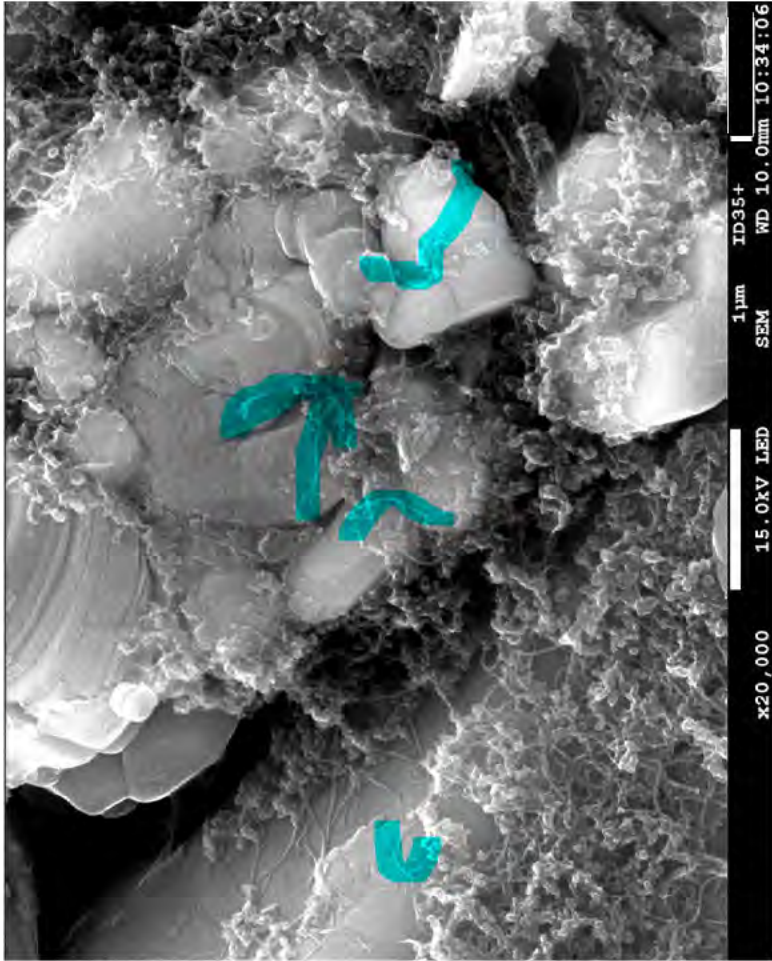
As another example, as depicted below, HG6 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface.



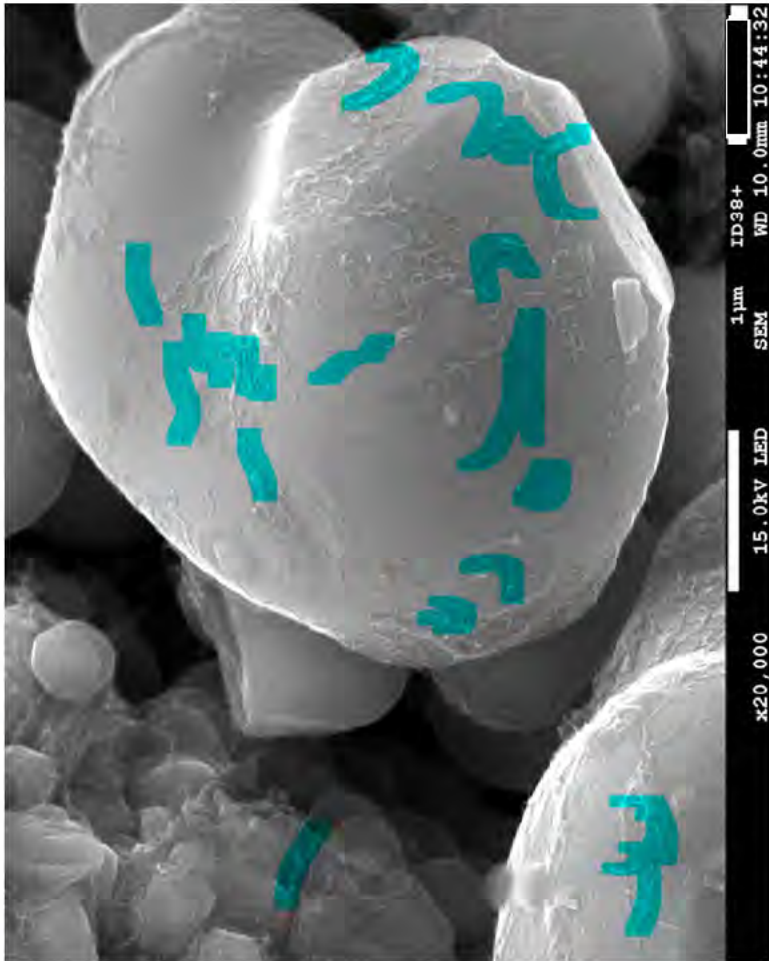
Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 

Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface.  The SEM image shows a surface with various features. Two areas are highlighted with blue marks: a small, irregular shape on the left and a larger, more complex shape on the right. The image includes technical data at the bottom: x20,000, 15.0kV, LED, SEM, 1µm scale bar, WD 10.0mm, and 14:36:20.

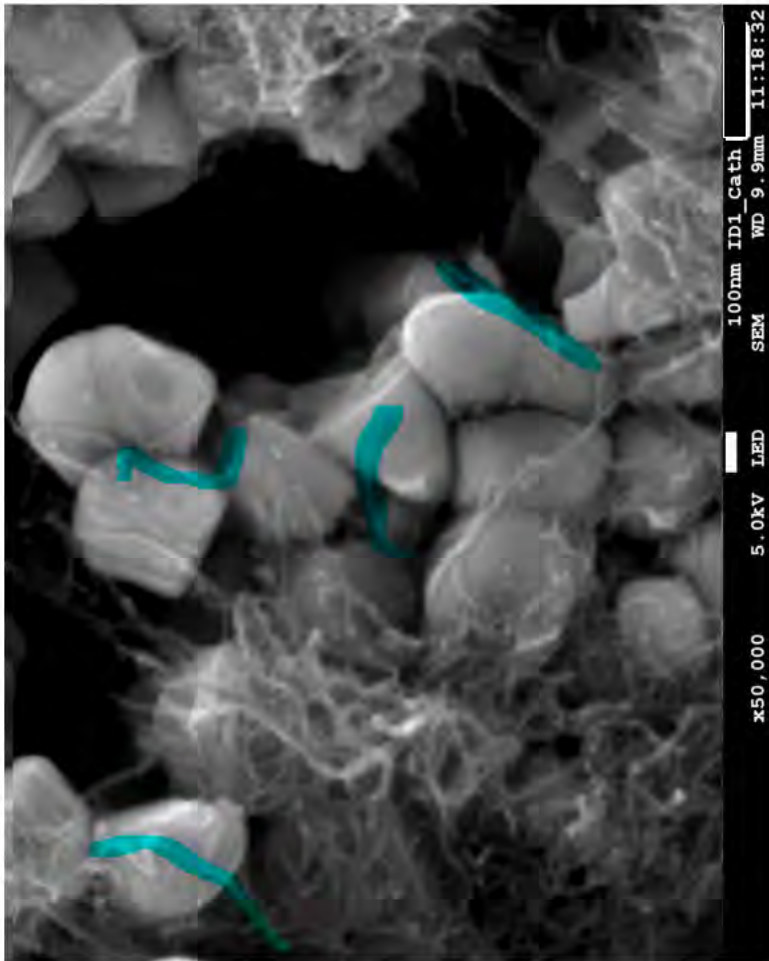
Claim	Contention
	As another example, as depicted below, E78 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 

Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 

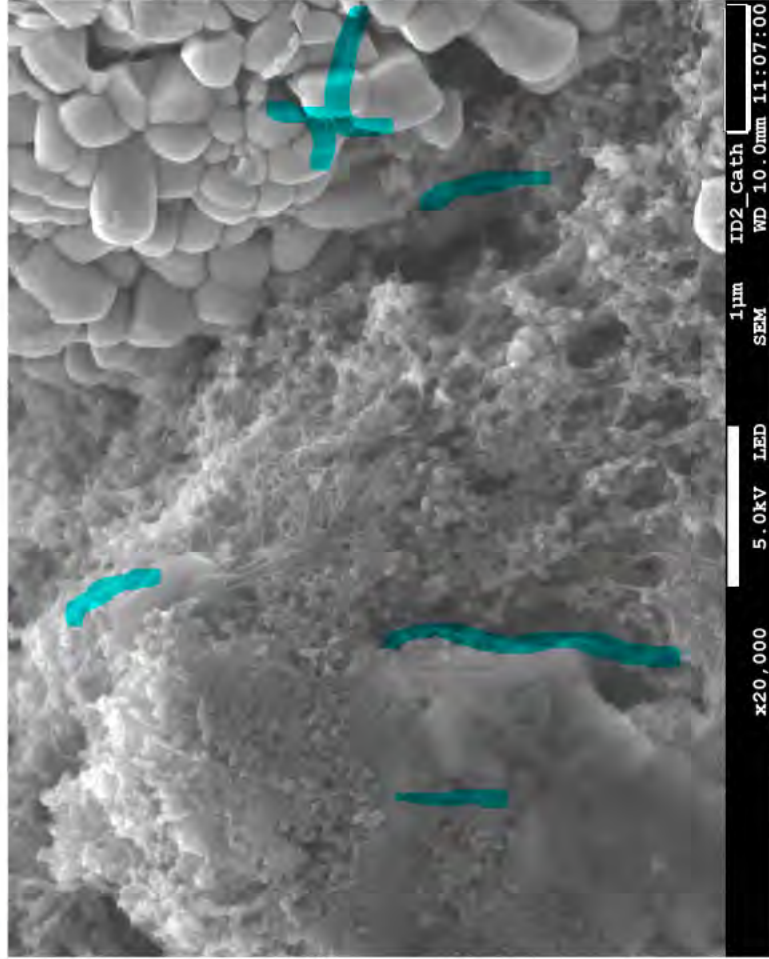
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

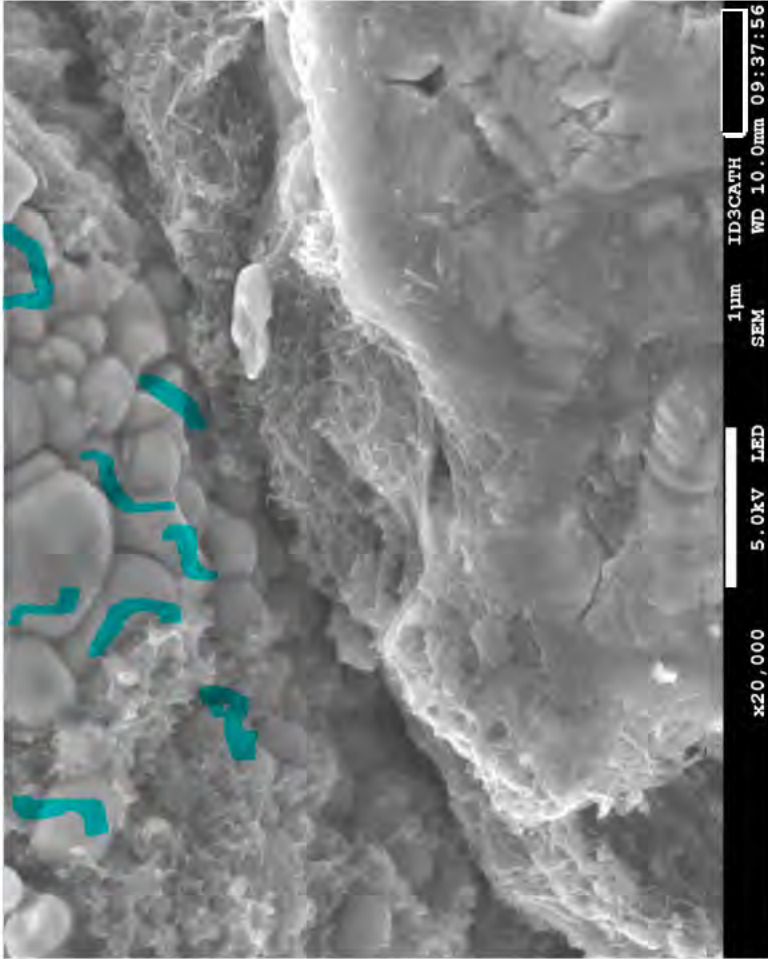
Claim	Contention
	As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 
and mixtures of ion active materials comprising migratable ions[,] said materials comprising crystals or layers of lithium ion active material.” Specifically, each of the '483 Accused Products comprises mixtures of ion active materials comprising migratable ions, such as those comprising the electrolyte (e.g., Li⁺ / PF6⁻).	

Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

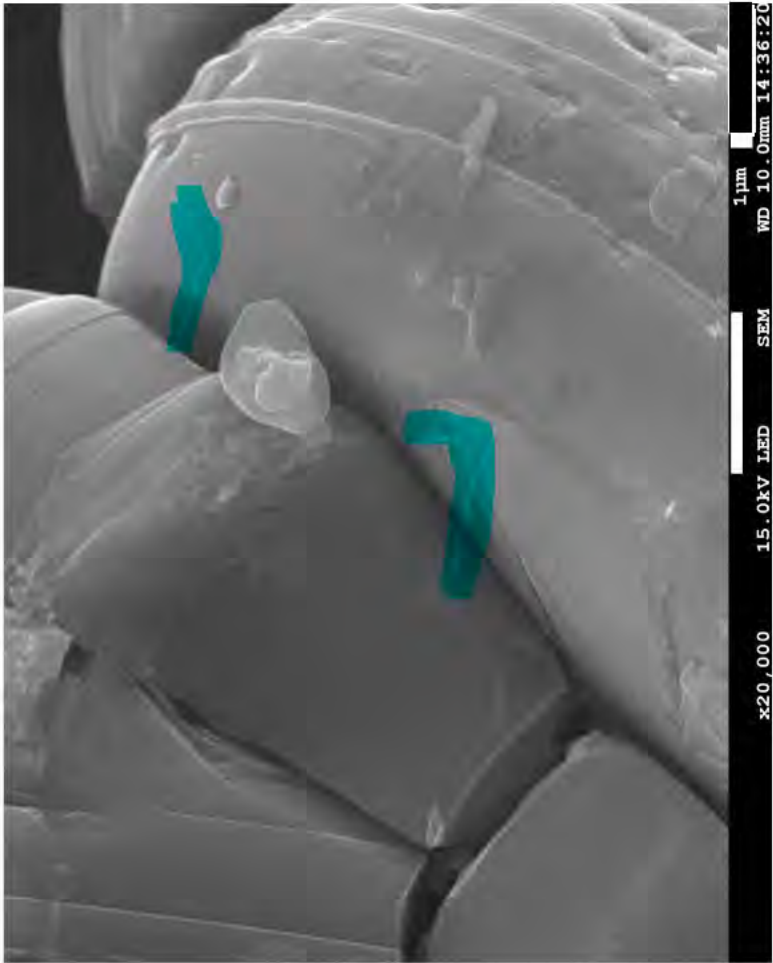
Claim	Contention
	Further, said materials comprise crystals of lithium-ion active material, including crystals comprised of NCM, NCA, LCO, and/or LFP. This is demonstrated by the below, which reflects that HG2 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 400-500 nm (nanoscale) in diameter. 

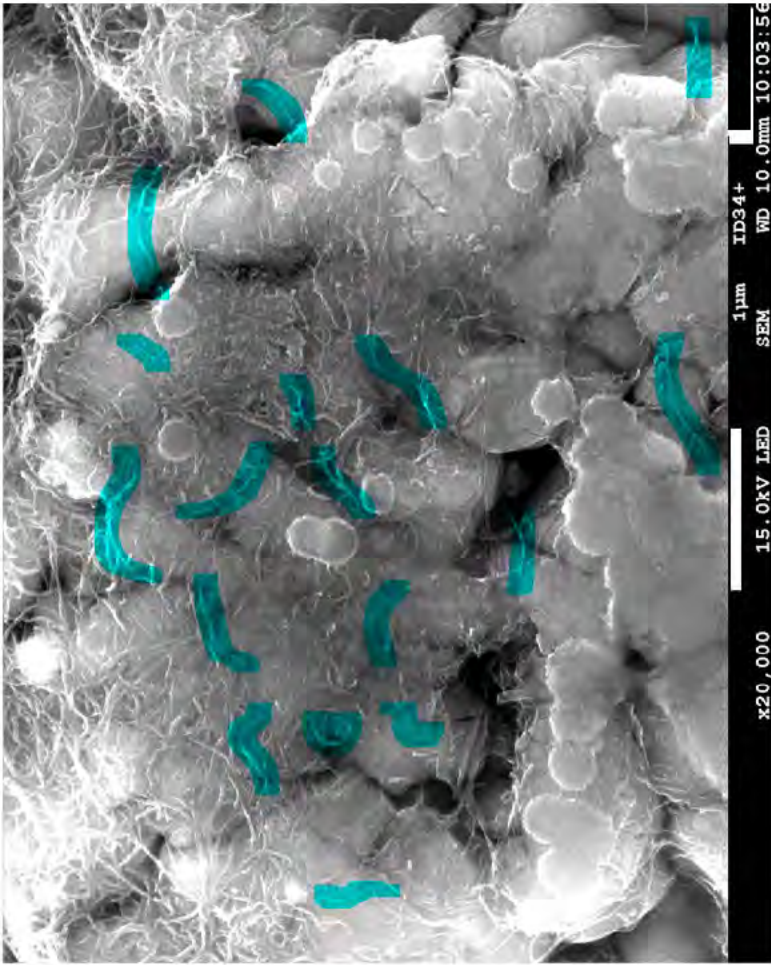
As another example, as depicted below, HG6 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200–400 nm (nanoscale) in diameter.

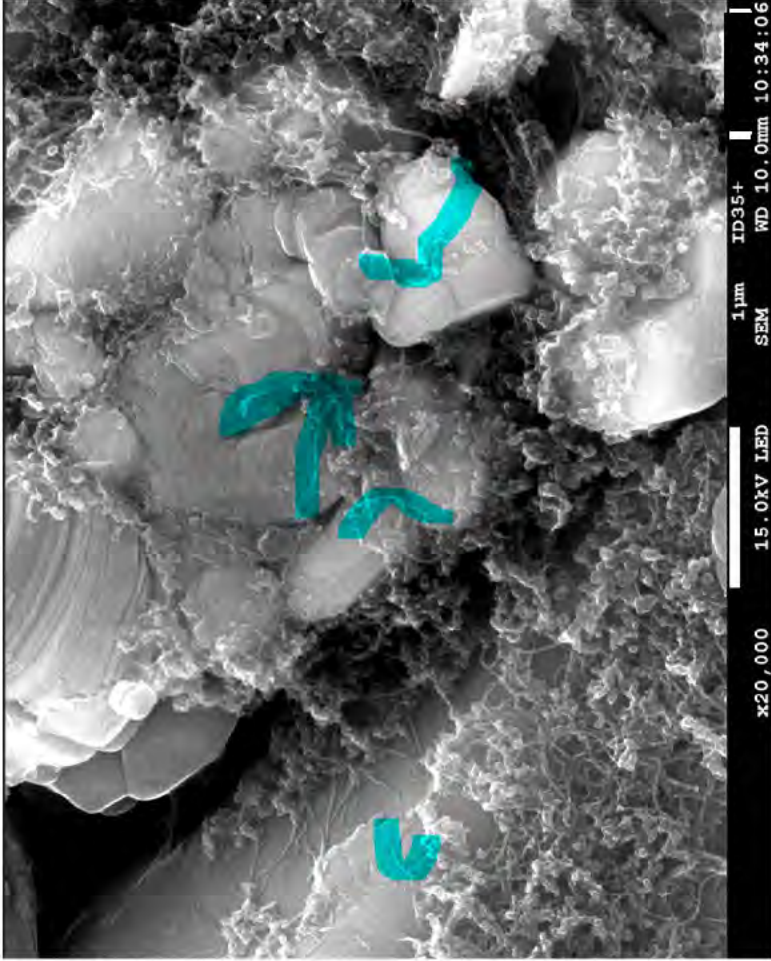


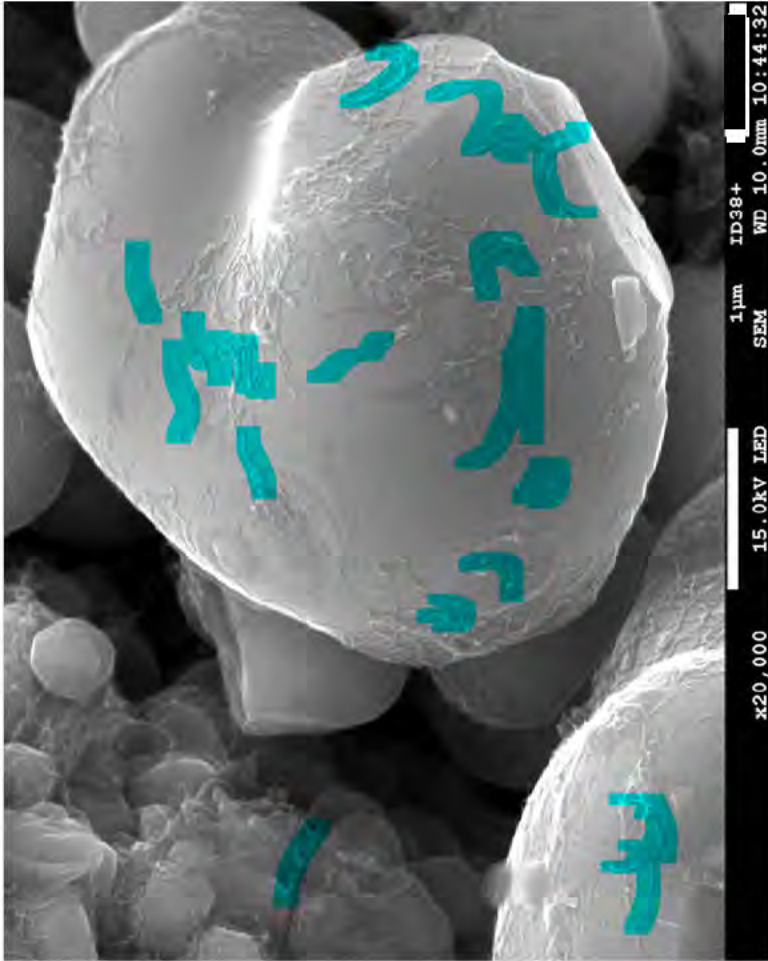
Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

Claim	Contention
	As another example, as depicted below, E78 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

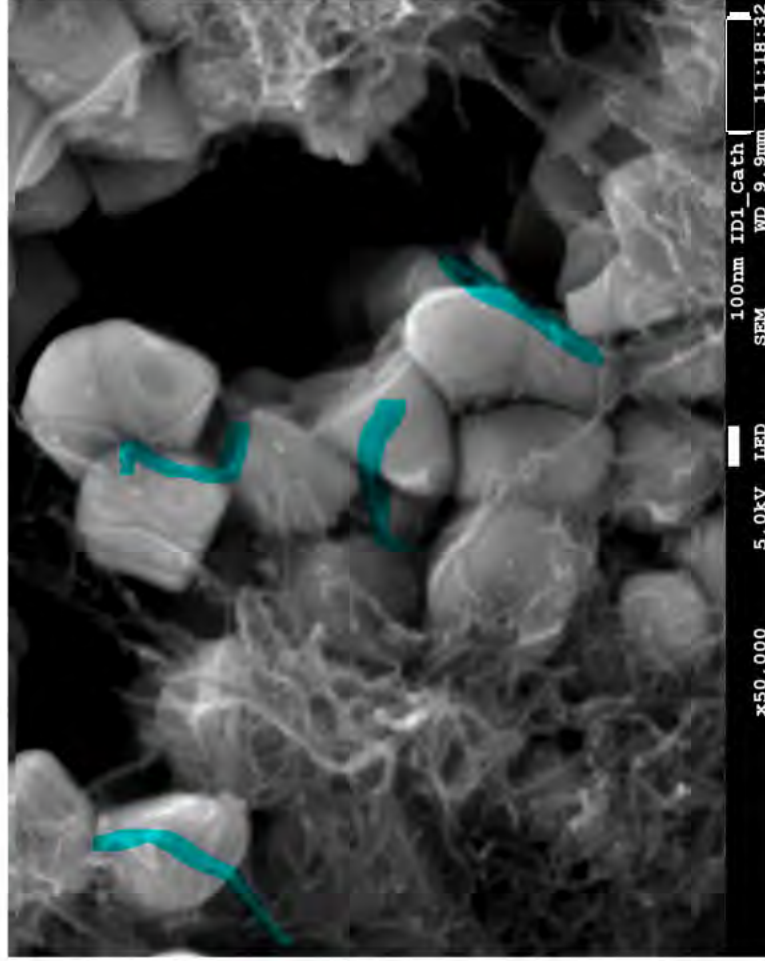
Claim	Contention
As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals. 	

Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)

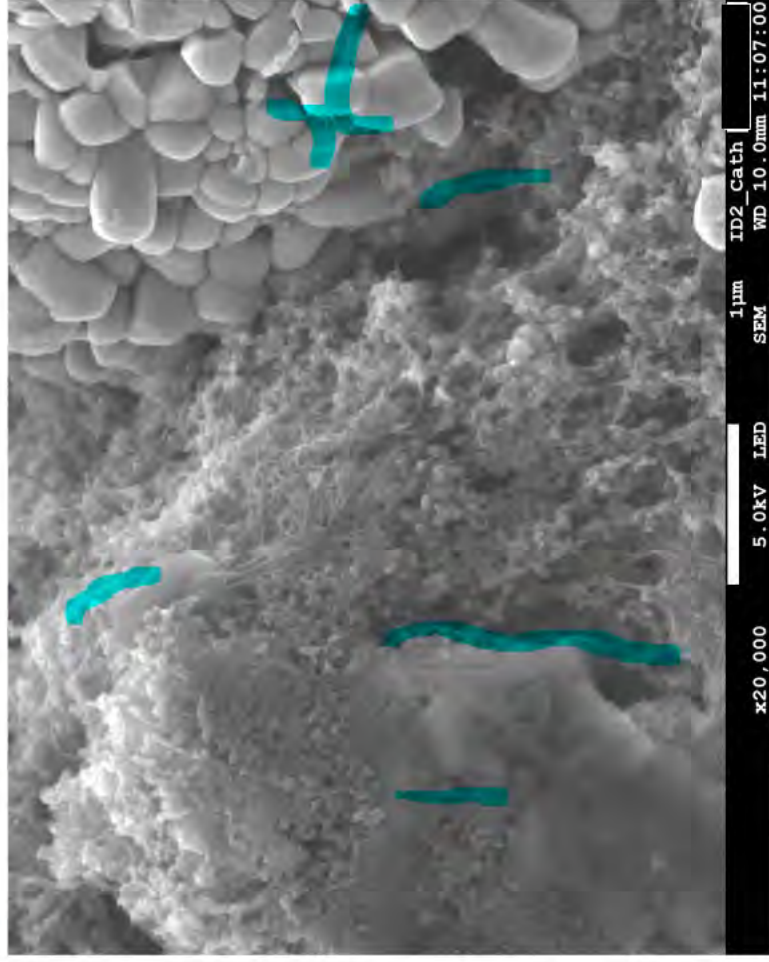
Infringement of U.S. Patent No. 10,153,483

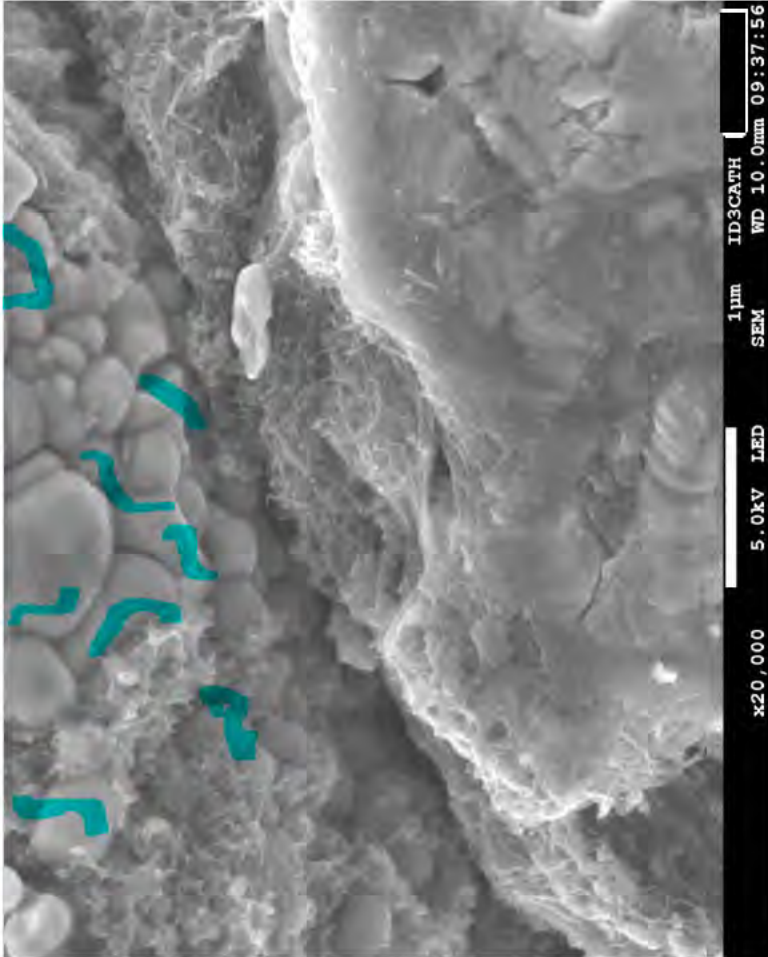
Contention	
wherein a ratio of lithium ion to other total ions in the ion active materials is at least 2:1 to 25:1,	This element is met by the '483 Accused Products, each of which comprises mixtures of ion active materials "wherein a ratio of lithium ion to other total ions in the ion active materials is at least 2:1 to 25:1." For example, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Further, each of the '483 Accused Products comprises a PF₆⁻ or similar Li⁺ counter-ion. Given the migratable nature of the Li⁺, its concentration within the cathode varies during charge and discharge processes but is configured to be within a 2:1 to 25:1 ratio at least when at approximately a 44% to 98% state of charge.
and wherein discrete carbon nanotubes have crystals or layers of lithium ion active material ionically attached to their surface	This element is met by the '483 Accused Products, each of which comprises "discrete carbon nanotubes have crystals or layers of lithium ion active material ionically attached to their surface." Specifically, each of the '483 Accused Products comprises discrete carbon nanotubes have crystals of lithium ion active material ionically attached to their surface.

This is demonstrated by the below, which reflects that HG2 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 400-500 nm (nanoscale) in diameter.

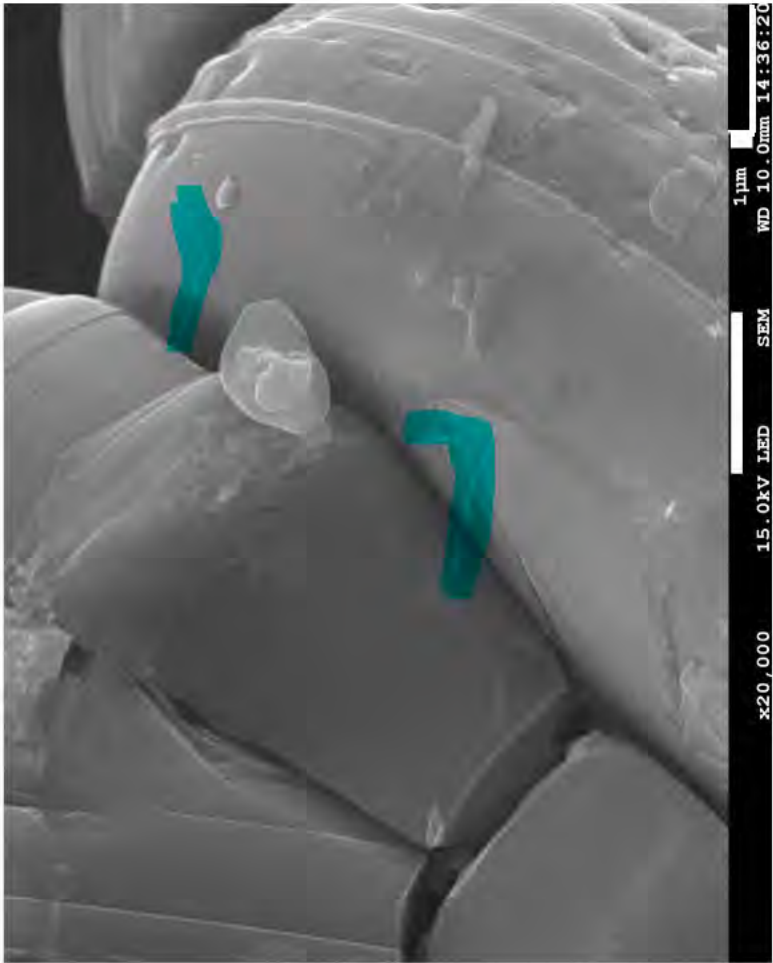


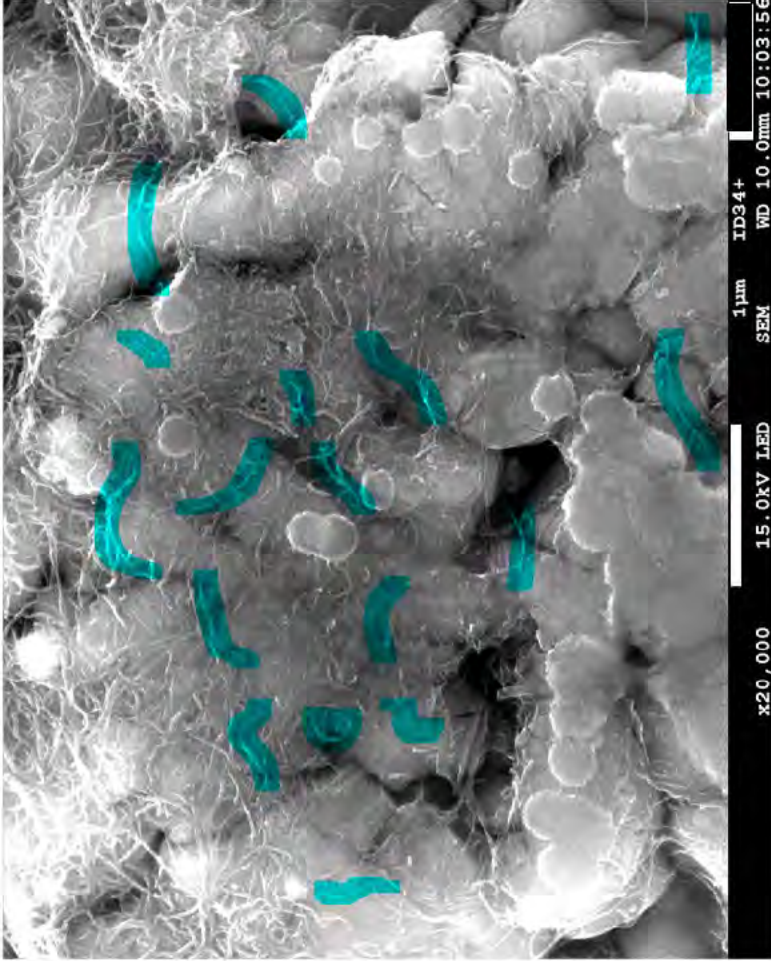
As another example, as depicted below, HG6 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200–400 nm (nanoscale) in diameter.

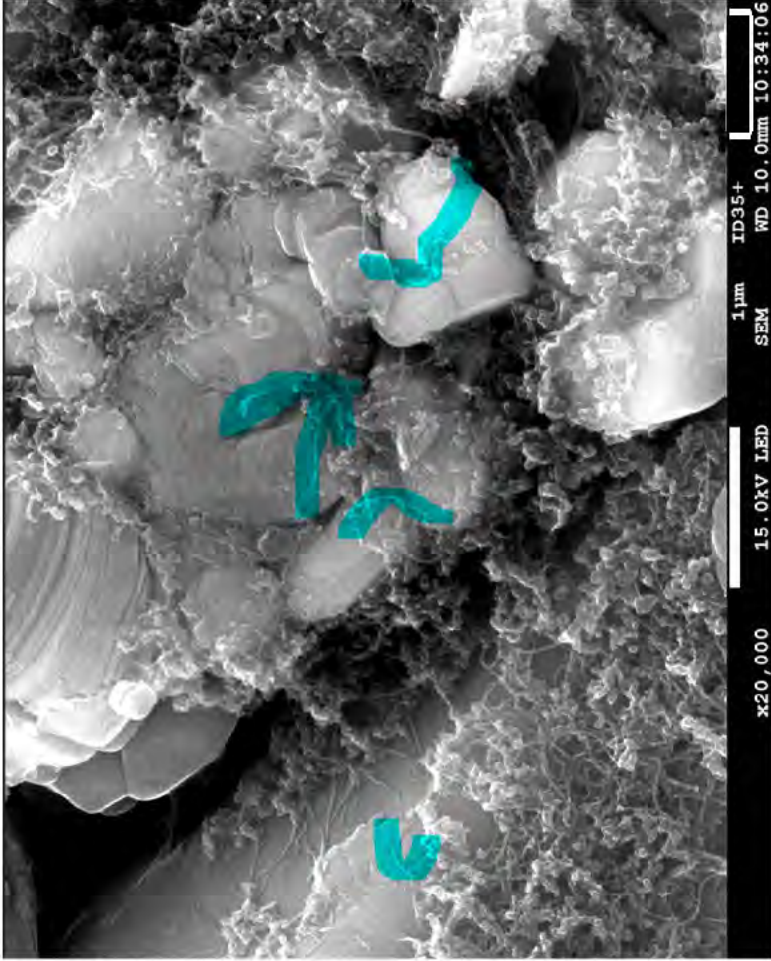


Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter.  The image is a scanning electron micrograph (SEM) showing a surface with numerous small, rounded, and somewhat irregular features, which are the nickel cobalt manganese (NCM) active material crystals. Several of these crystals are highlighted with blue outlines, indicating the presence of discrete nanotubes attached to their surfaces. The nanotubes appear as thin, elongated structures extending from the crystals. The background is a textured, granular surface. Technical data at the bottom of the image includes: x20,000 magnification, 5.0kV voltage, LED, SEM, 1µm scale bar, ID3CATH, WD 10.0mm, and a timestamp of 09:37:56.

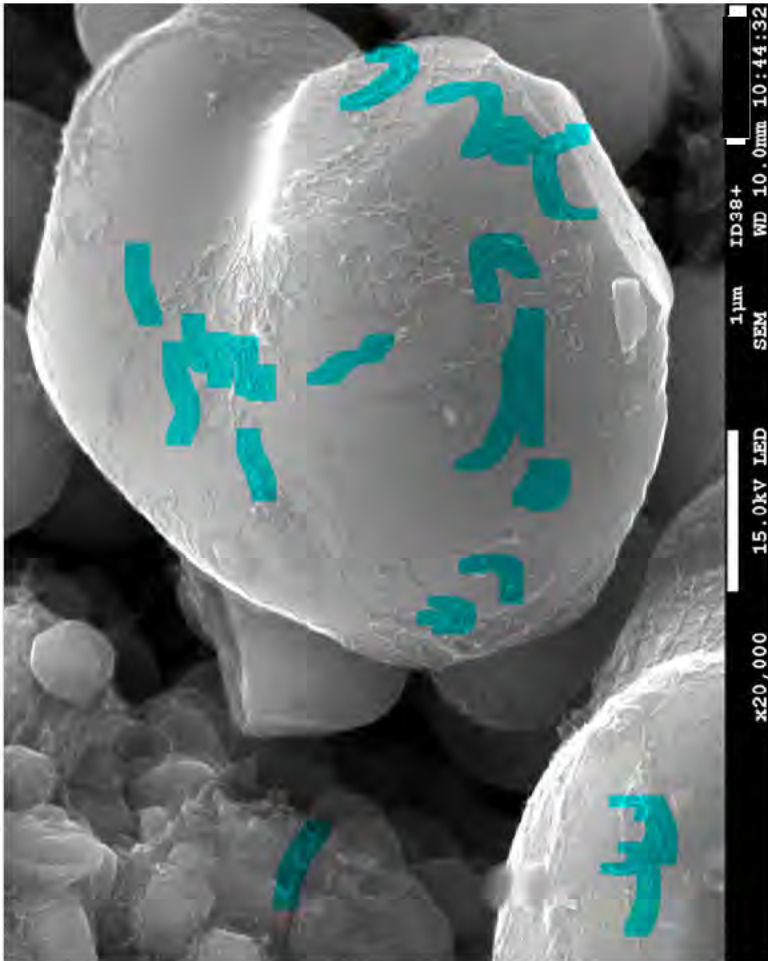
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

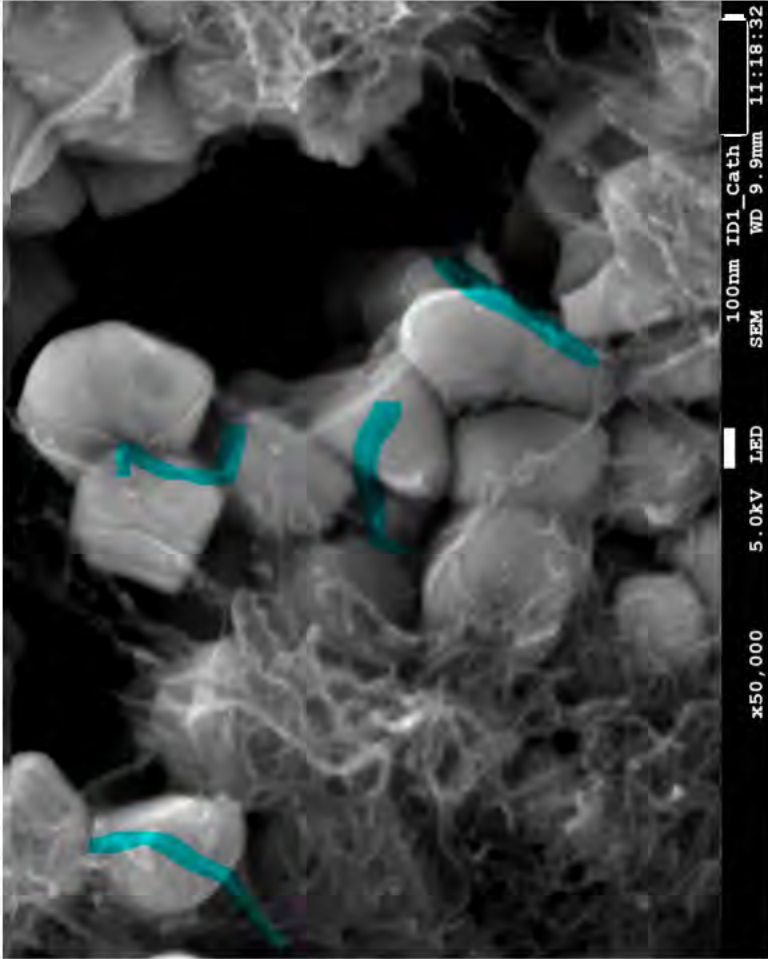
Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

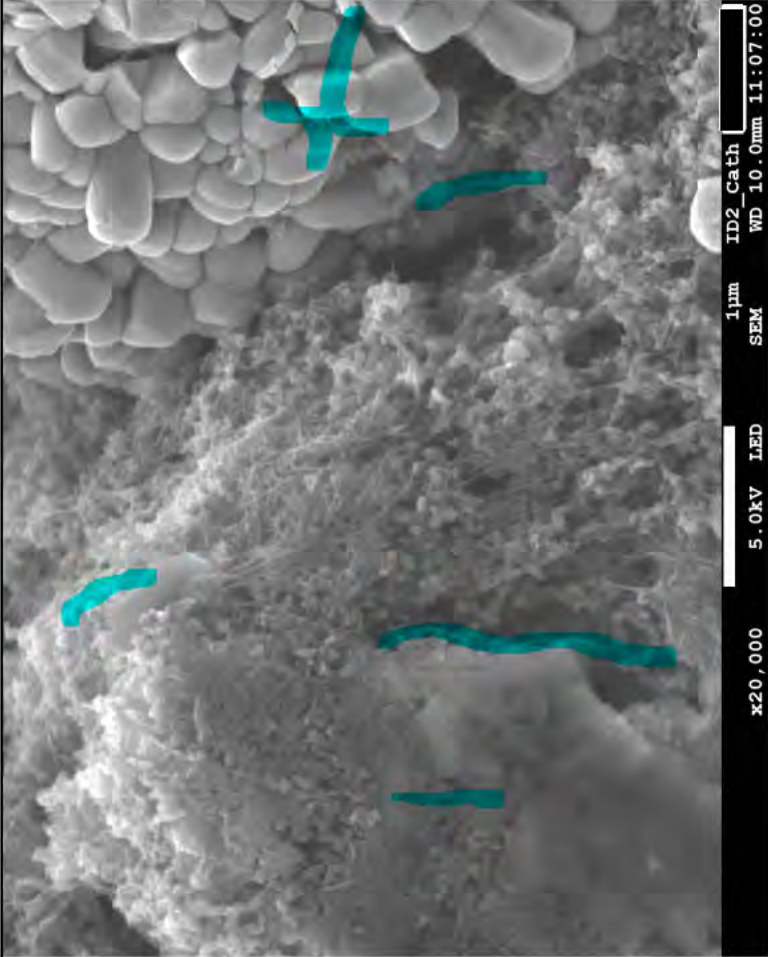
Claim	Contention
	As another example, as depicted below, E78 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

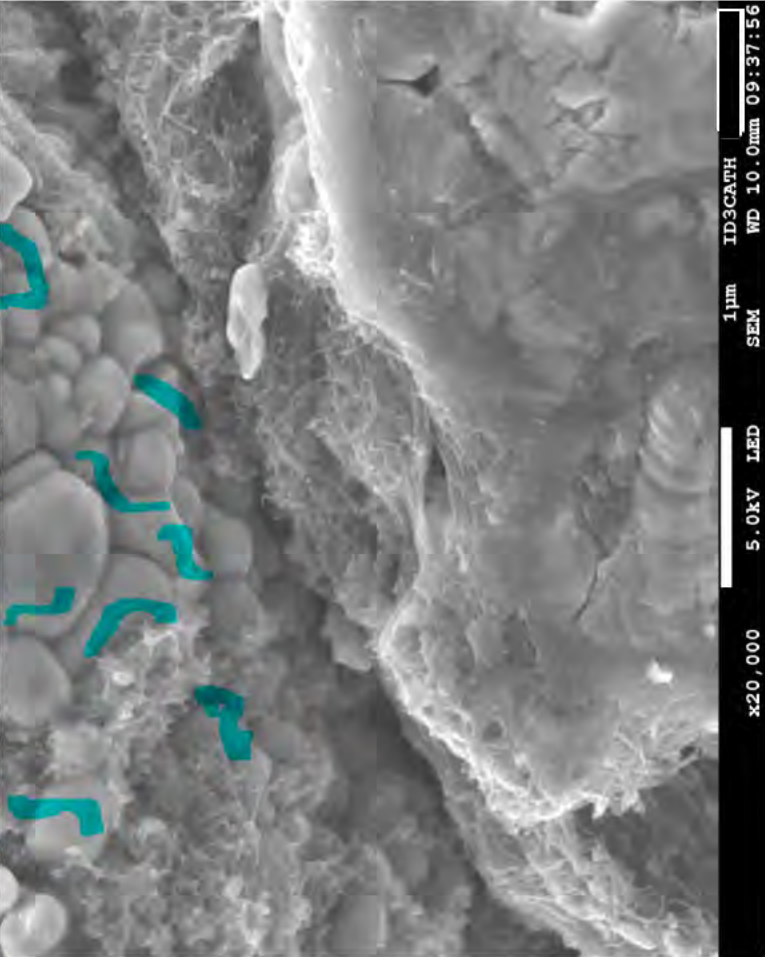
Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

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Infringement of U.S. Patent No. 10,153,483

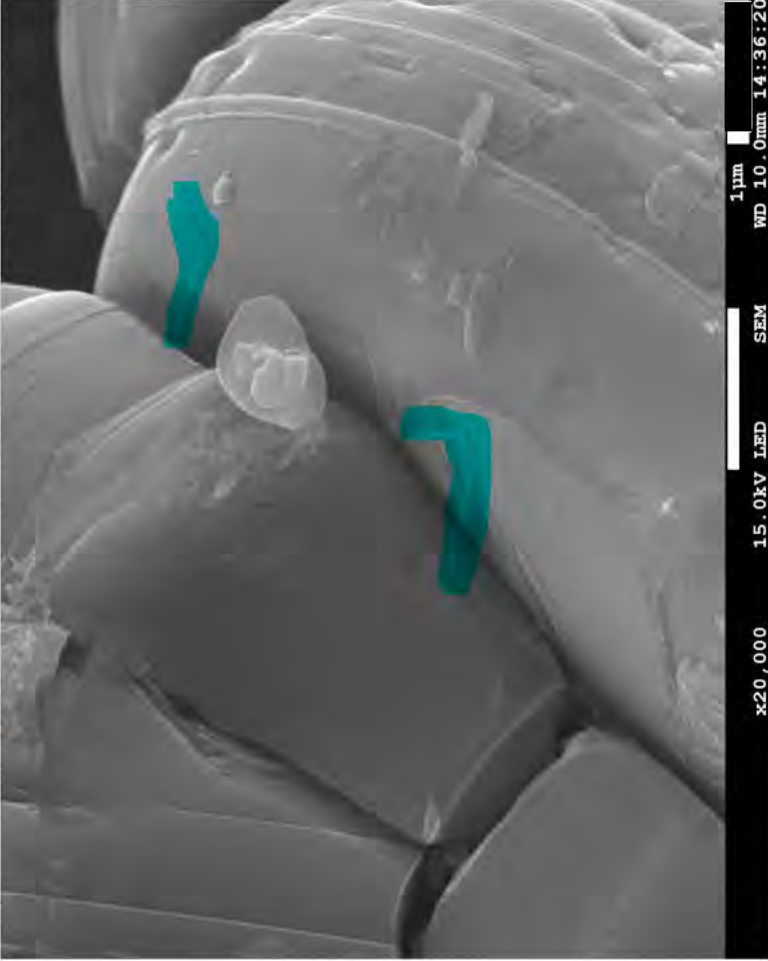
Claim	Contention
	As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals.  The image is a scanning electron micrograph (SEM) showing a surface with various particles. A large, irregularly shaped, light-colored particle is the central focus. It has a rough, textured surface. Several smaller, darker, more rounded particles are visible in the background and foreground. Overlaid on the image are several blue, hand-drawn markings that highlight specific features on the surface of the large central particle. These markings appear to be small, curved lines or segments, possibly representing the nanotubes mentioned in the text. In the bottom right corner of the image, there is a technical data bar with the following text: x20,000, 15.0kV, LED, 1µm, ID38+, SEM, WD 10.0mm, 10:44:32.
and wherein the carbon nanotubes are in a weight ratio of carbon nanotubes to lithium salts of 0.1% to 10%	This element is met by the '483 Accused Products, each of which comprises a composition "wherein the carbon nanotubes are in a weight ratio of carbon nanotubes to lithium salts of 0.1% to 10%." Specifically, each of the '483 Accused Products comprises a composition comprising discrete carbon nanotubes having crystals of lithium salts attached to their surface in a weight percentage of 0.1% to 4% by weight of the lithium ion active material.

Claim	Contention
	This is demonstrated by the below, which reflects that HG2 comprises nanotubes (highlighted in blue) in a weight percentage between 0.1% and 4% by weight of the lithium ion active material:  As another example, as depicted below, HG6 comprises nanotubes (highlighted in blue) in a weight percentage between 0.1% and 4% by weight of the lithium ion active material:

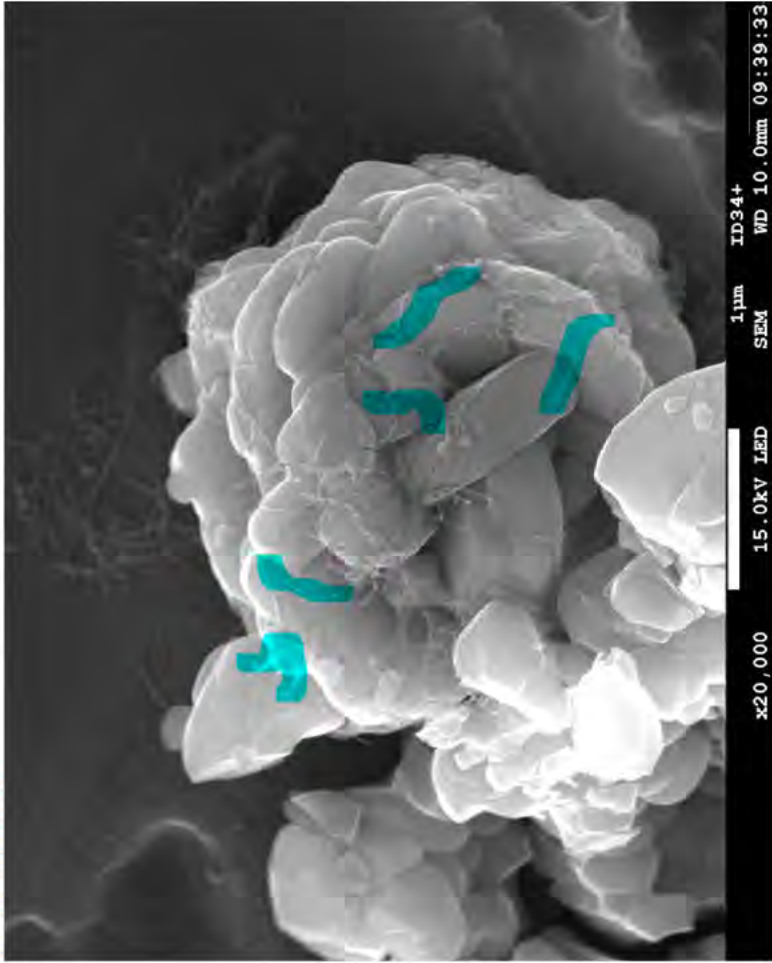
Claim	Contention
	

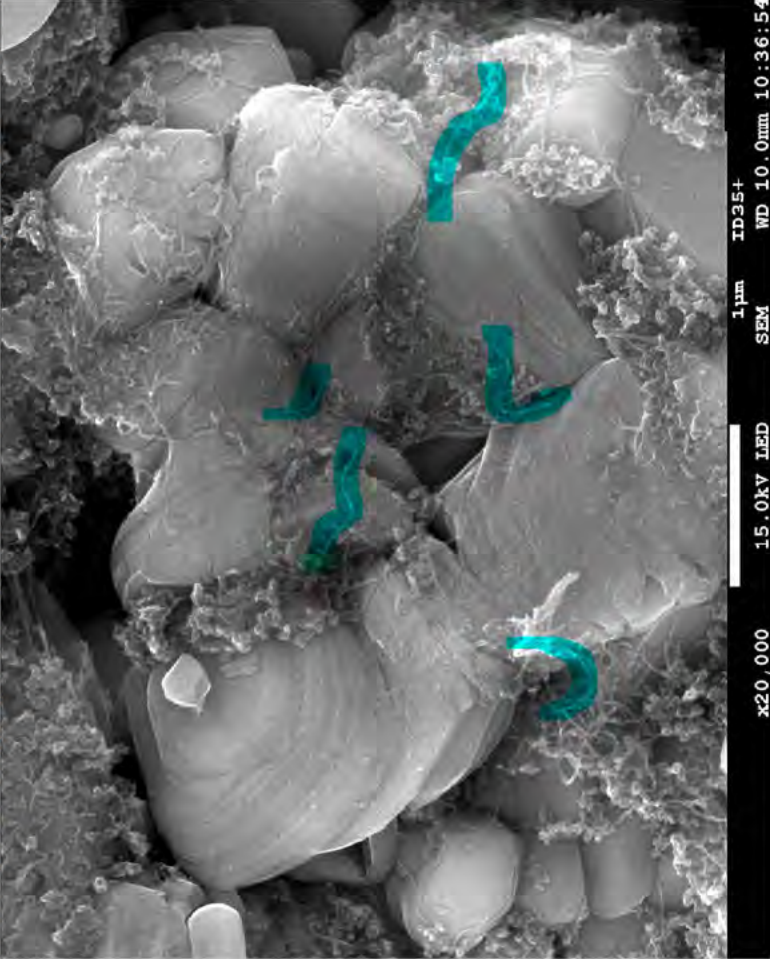
Claim	Contention
	As another example, as depicted below, MJ1 comprises nanotubes (highlighted in blue) in a weight percentage between 0.1% and 4% by weight of the lithium ion active material: 

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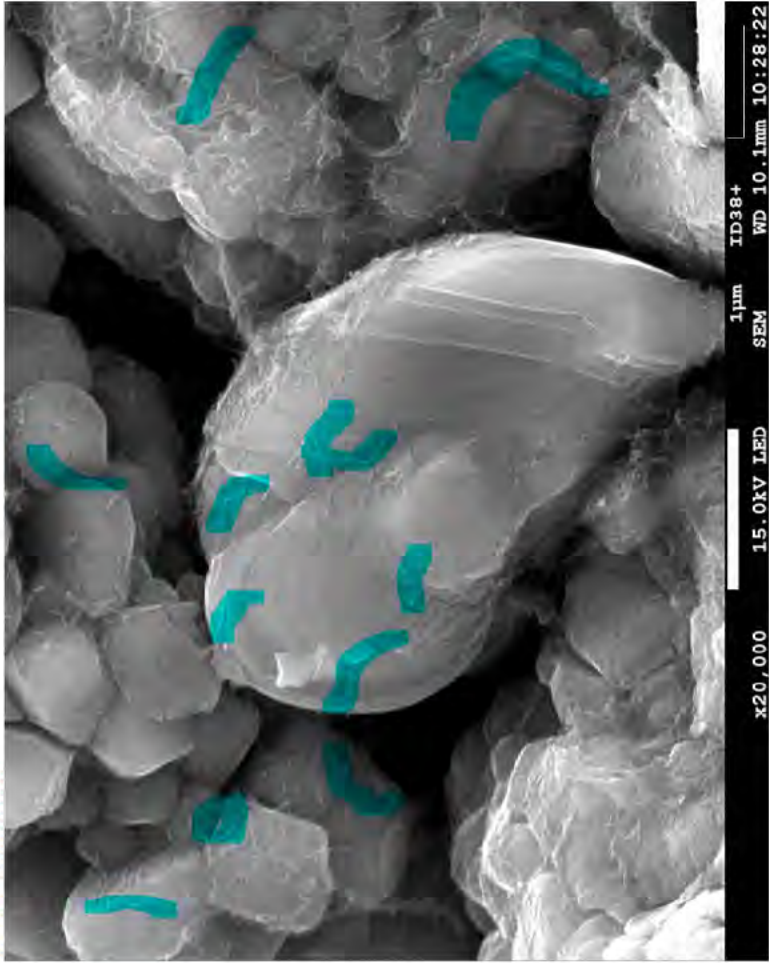
Claim	Contention
	As another example, as depicted below, the LG Gram Battery comprises nanotubes (highlighted in blue) in a weight percentage between 0.1% and 4% by weight of the lithium ion active material:  The image is a grayscale SEM micrograph showing a textured surface of a battery component. Two specific features are highlighted with blue brush strokes: a small, rounded, crystalline-like structure on the left and a larger, more elongated, and irregular structure on the right. The background shows various ridges, valleys, and smaller particles. A technical data bar at the bottom of the image reads: 'x20,000 15.0kV LED SEM 1µm WD 10.0mm 14:36:20'.

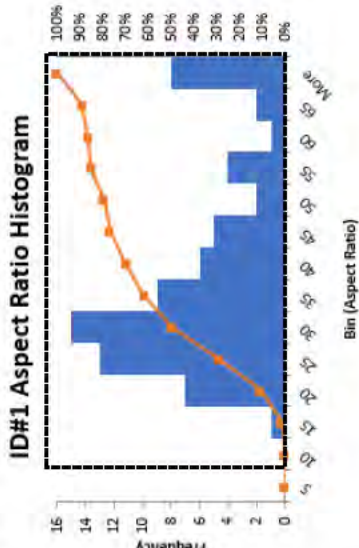
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

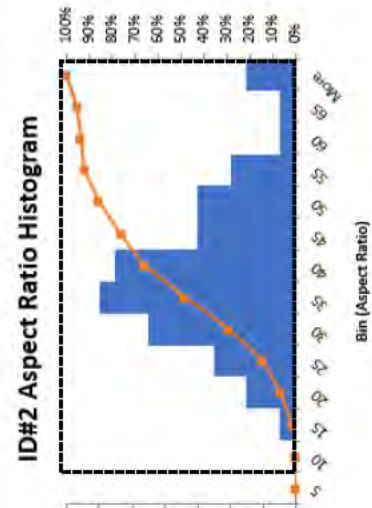
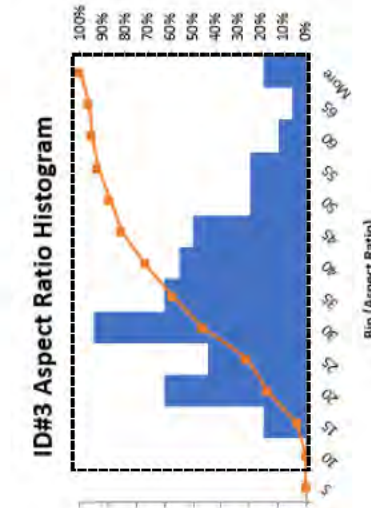
Claim	Contention
	As another example, as depicted below, the LG E78 eVehicle/ESS Pouch comprises nanotubes (highlighted in blue) in a weight percentage between 0.1% and 4% by weight of the lithium ion active material: 

Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises nanotubes (highlighted in blue) in a weight percentage between 0.1% and 4% by weight of the lithium ion active material: 

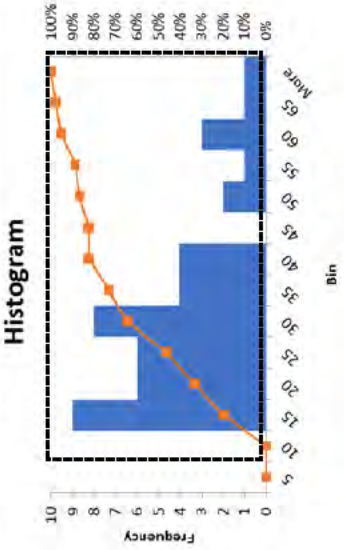
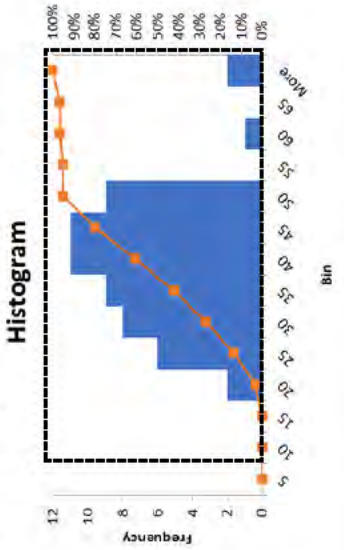
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
Infringement of U.S. Patent No. 10,153,483

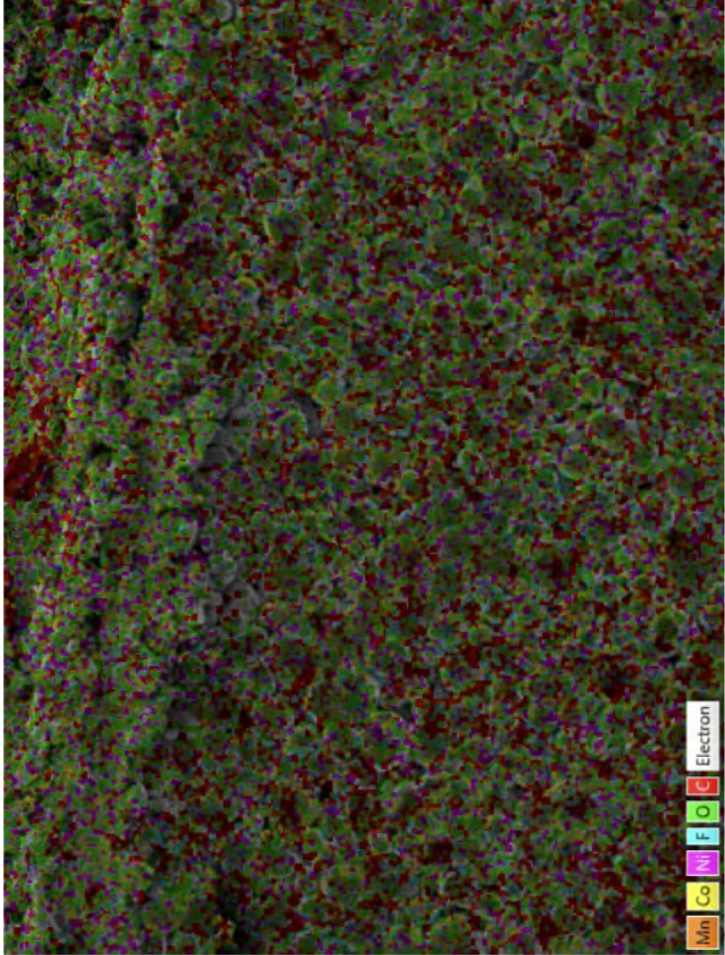
Claim	Contention
	As another example, as depicted below, the LG G8 Cellphone Battery ('19) comprises nanotubes (highlighted in blue) in a weight percentage between 0.1% and 4% by weight of the lithium ion active material: 
and wherein the discrete carbon nanotubes comprise oxidized species selected from the group consisting of carboxylic, ketone, or hydroxyl functionalities,	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes "wherein the discrete carbon nanotubes comprise oxidized species selected from the group consisting of carboxylic, ketone, or hydroxyl functionalities." Specifically, each of the '483 Accused Products include discrete carbon nanotubes that comprise carboxylic, ketone, and/or hydroxyl functionalities.

Claim	Contention																																																															
and wherein the discrete carbon nanotubes have an aspect ratio of 10 to 500	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes “wherein the discrete carbon nanotubes have an aspect ratio of 10 to 500.” Specifically, each of the '483 Accused Products comprises carbon nanotubes having an aspect ratio of between 10 to 500 when its length is divided by its diameter. This is demonstrated by the below, which reflects that the '483 Accused Products comprise discrete nanotubes with an aspect ratio typically between 10 and 100: HG2  The histogram, titled "ID#1 Aspect Ratio Histogram", displays the frequency of aspect ratios for discrete carbon nanotubes. The x-axis represents the "Bin (Aspect Ratio)" with values from 0 to 100. The y-axis represents "Frequency" from 0 to 16. The histogram bars are blue, and an orange line with markers indicates the cumulative distribution. The data shows a high frequency of nanotubes with aspect ratios between 10 and 20, with the frequency decreasing as the aspect ratio increases. <table><caption>Approximate Data from ID#1 Aspect Ratio Histogram</caption><thead><tr><th>Bin (Aspect Ratio)</th><th>Frequency</th><th>Cumulative Frequency (%)</th></tr></thead><tbody><tr><td>0-5</td><td>1</td><td>~5%</td></tr><tr><td>5-10</td><td>2</td><td>~10%</td></tr><tr><td>10-15</td><td>4</td><td>~20%</td></tr><tr><td>15-20</td><td>8</td><td>~40%</td></tr><tr><td>20-25</td><td>10</td><td>~55%</td></tr><tr><td>25-30</td><td>12</td><td>~65%</td></tr><tr><td>30-35</td><td>14</td><td>~75%</td></tr><tr><td>35-40</td><td>15</td><td>~85%</td></tr><tr><td>40-45</td><td>14</td><td>~90%</td></tr><tr><td>45-50</td><td>12</td><td>~95%</td></tr><tr><td>50-55</td><td>10</td><td>~98%</td></tr><tr><td>55-60</td><td>8</td><td>~99%</td></tr><tr><td>60-65</td><td>6</td><td>~100%</td></tr><tr><td>65-70</td><td>4</td><td>~100%</td></tr><tr><td>70-75</td><td>2</td><td>~100%</td></tr><tr><td>75-80</td><td>1</td><td>~100%</td></tr><tr><td>80-85</td><td>1</td><td>~100%</td></tr><tr><td>85-90</td><td>1</td><td>~100%</td></tr><tr><td>90-95</td><td>1</td><td>~100%</td></tr><tr><td>95-100</td><td>1</td><td>~100%</td></tr></tbody></table>	Bin (Aspect Ratio)	Frequency	Cumulative Frequency (%)	0-5	1	~5%	5-10	2	~10%	10-15	4	~20%	15-20	8	~40%	20-25	10	~55%	25-30	12	~65%	30-35	14	~75%	35-40	15	~85%	40-45	14	~90%	45-50	12	~95%	50-55	10	~98%	55-60	8	~99%	60-65	6	~100%	65-70	4	~100%	70-75	2	~100%	75-80	1	~100%	80-85	1	~100%	85-90	1	~100%	90-95	1	~100%	95-100	1	~100%
Bin (Aspect Ratio)	Frequency	Cumulative Frequency (%)																																																														
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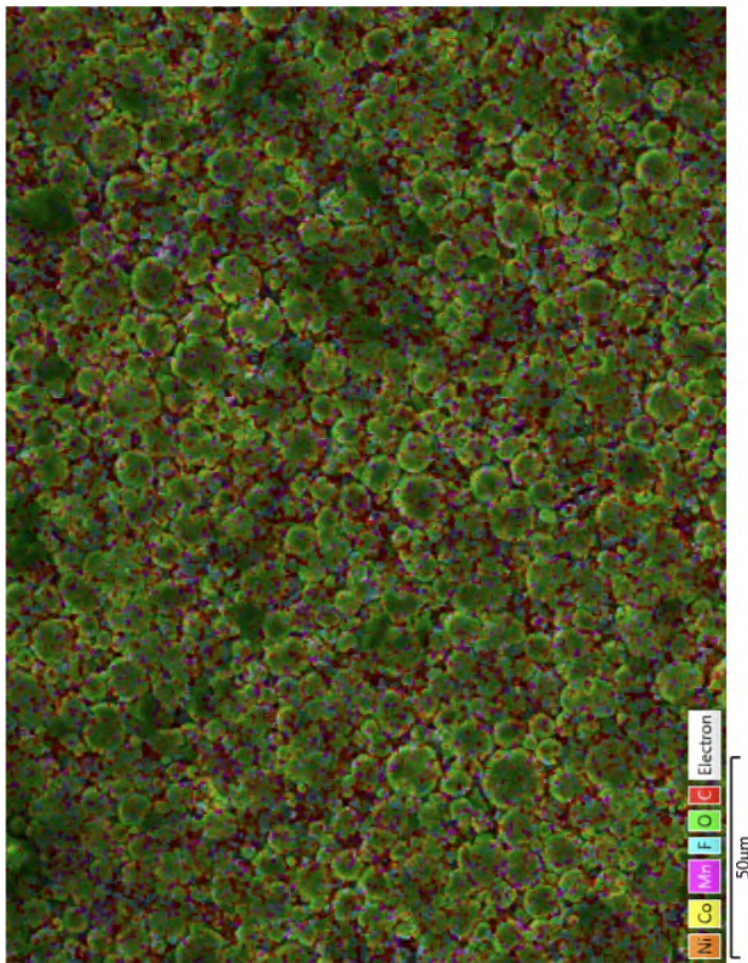
Claim	Contention
HG6  The histogram for ID#2 shows the frequency distribution of aspect ratios. The x-axis is labeled 'Bin (Aspect Ratio)' with values from 5 to 100. The y-axis is labeled 'Frequency' with values from 0 to 14. The distribution is skewed to the right, with a peak frequency of approximately 12 at a bin value of 10. An orange line with diamond markers represents a cumulative distribution curve, starting at (5, 0) and ending at (100, 100%). MJ1  The histogram for ID#3 shows the frequency distribution of aspect ratios. The x-axis is labeled 'Bin (Aspect Ratio)' with values from 5 to 100. The y-axis is labeled 'Frequency' with values from 0 to 16. The distribution is skewed to the right, with a peak frequency of approximately 14 at a bin value of 10. An orange line with diamond markers represents a cumulative distribution curve, starting at (5, 0) and ending at (100, 100%).	

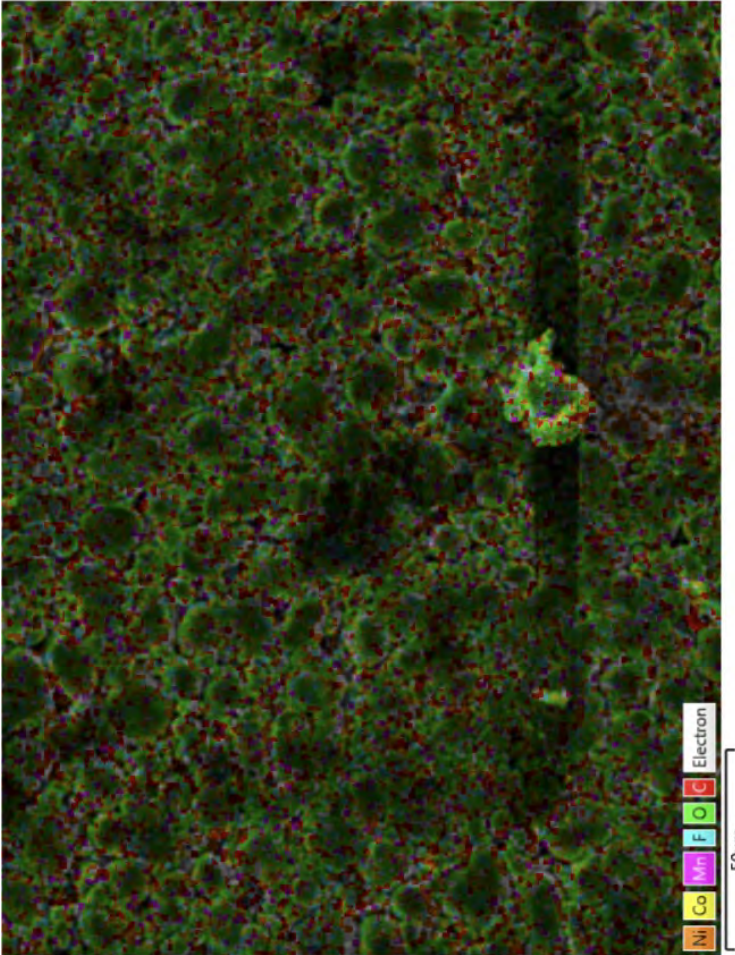
Claim	Contention
	LG Gram Laptop ('22) Histogram Frequency Bin (aspect Ratio) More
	LG E78 eVehicle/ESS Pouch: Histogram Frequency Bin More

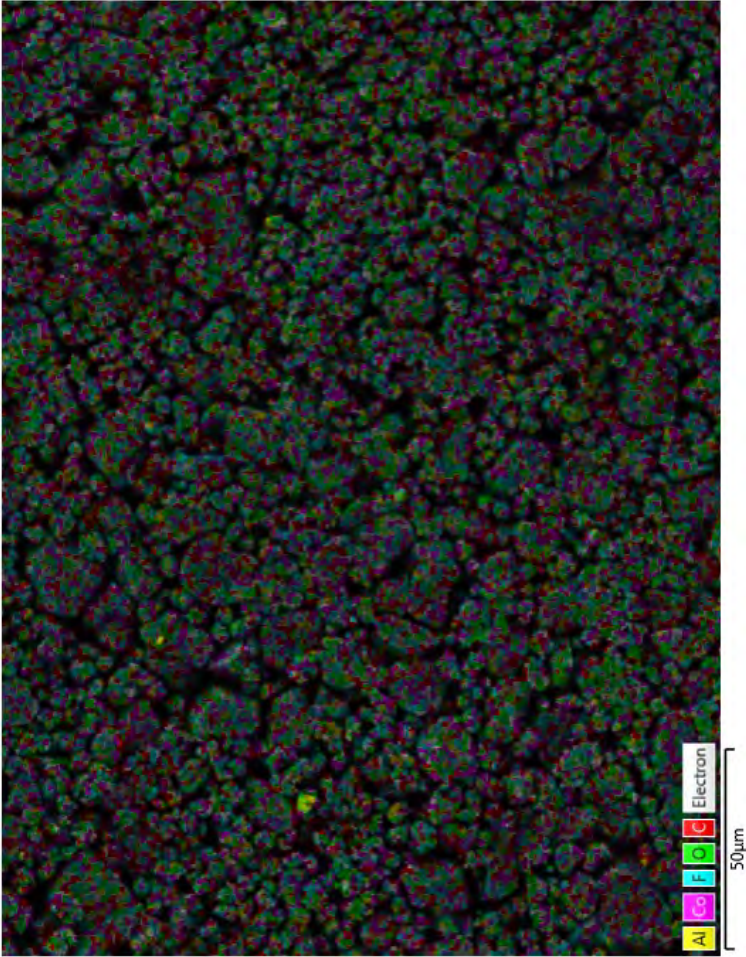
Claim	Contention
	LG Gram Laptop ('19):  LG G8 Cellphone Battery ('19): 
and oxidation levels from 1% to 15% by weight of the carbon nanotube.	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes "wherein the discrete carbon nanotubes have ... oxidation levels from 1% to 15% by weight of the carbon nanotube." Specifically, each of the '483 Accused Products comprises carbon nanotubes having oxidation levels not exceeding 15% by weight of the carbon nanotube, with the majority having oxidation levels of approximately 1% to 3% by weight of the carbon nanotube.

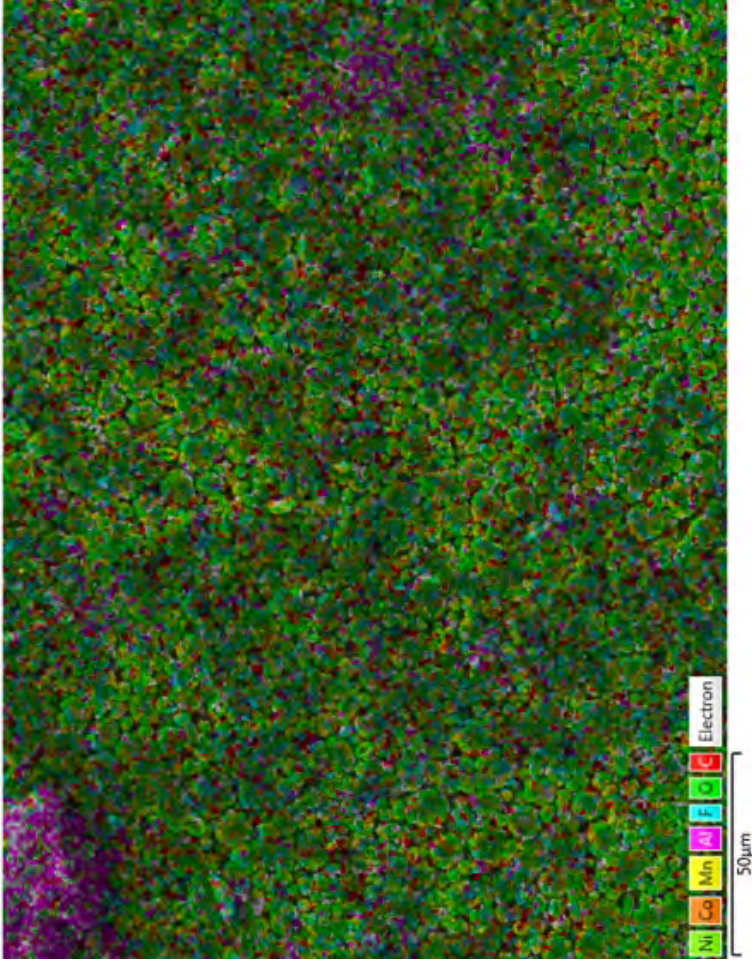
Claim		Contention
		This is demonstrated in part by the below, which reflects the presence of oxygen in each sample. HG2  The image is an EDS spectrum for sample HG2. It displays a series of peaks corresponding to different elements: Mn (Manganese), Co (Cobalt), Ni (Nickel), F (Fluorine), O (Oxygen), and C (Carbon). A scale bar at the bottom indicates a length of 50um. The spectrum shows a complex pattern of peaks, with the most prominent ones being Mn, Co, Ni, and O. The presence of O (Oxygen) is highlighted as a key finding in the contention.

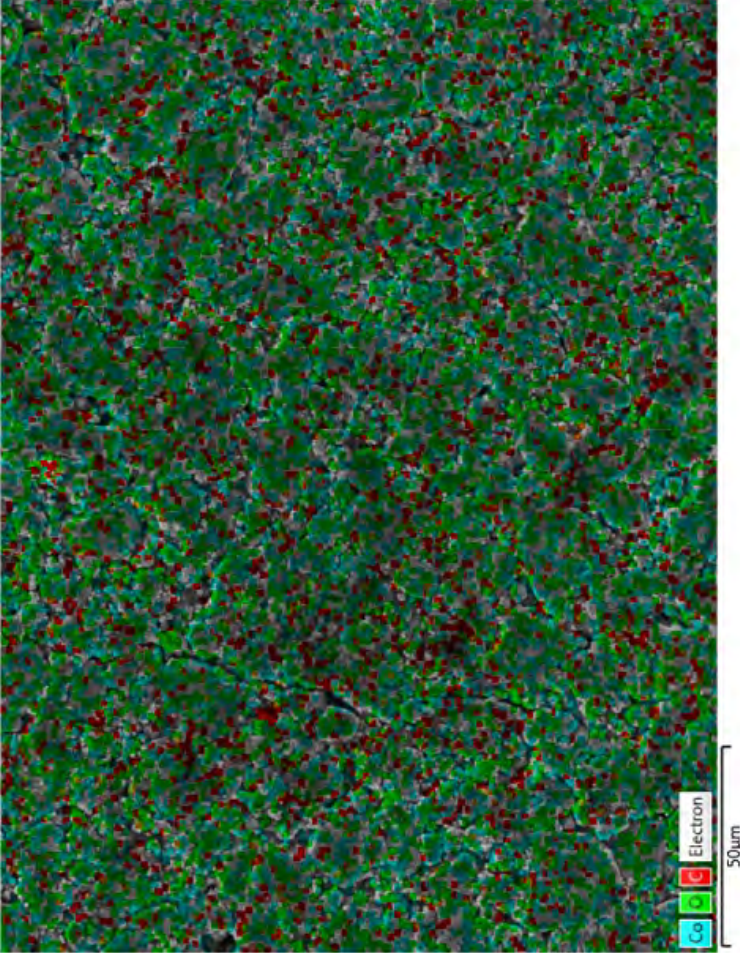
HG6



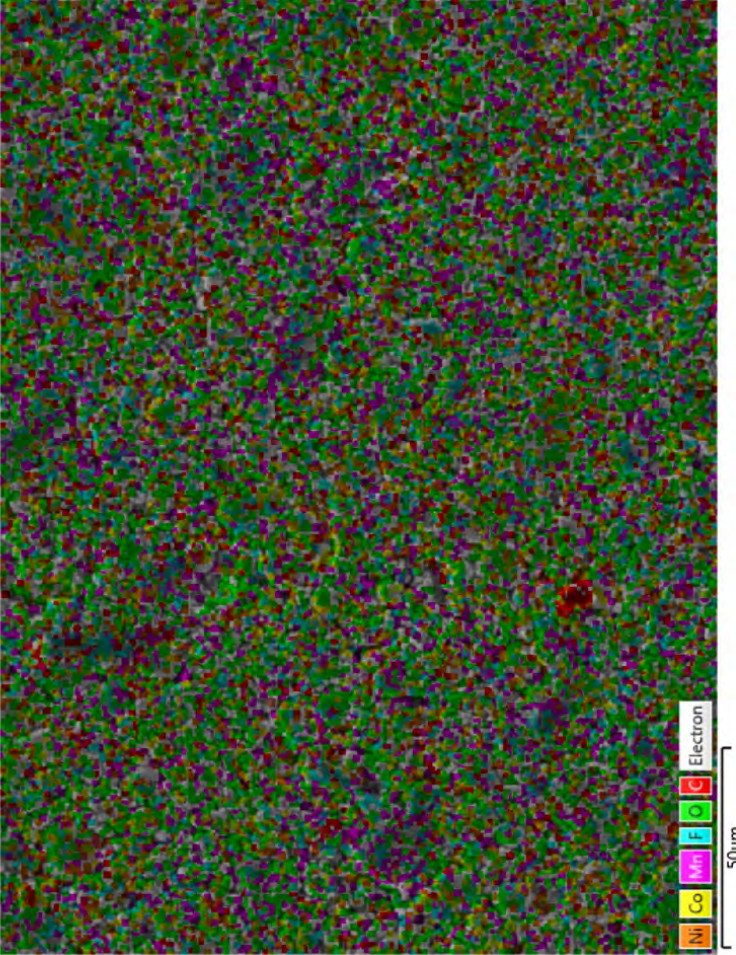
Claim		Contention
		MJ1 

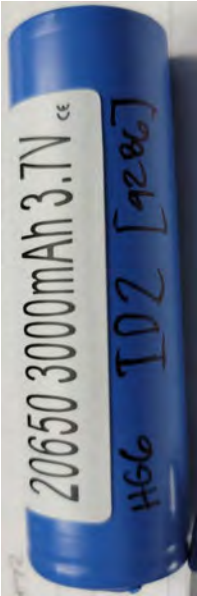
Claim		Contention
		LG Gram Laptop ('22): EDS Layered Image 1  The image is a color-coded EDS (Energy Dispersive Spectroscopy) layered image. It shows a dense, granular surface texture. A scale bar in the bottom right corner indicates 50µm. A legend in the bottom right corner identifies the colors: Al (yellow), Co (magenta), F (cyan), C (red), and Electron (white). The image is labeled 'EDS Layered Image 1'.

Claim		Contention
		LG E78 eVehicle/ESS Pouch: EDS Layered Image 2 

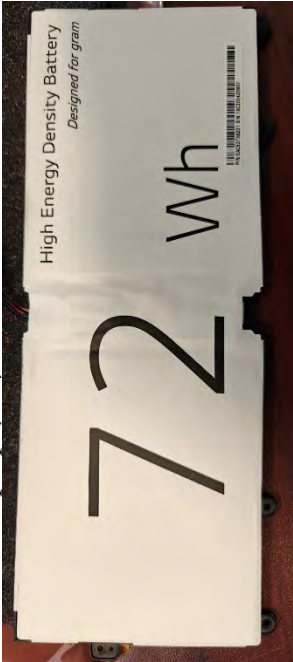
Claim		Contention
		LG Gram Laptop ('19): EDS Layered Image 3 

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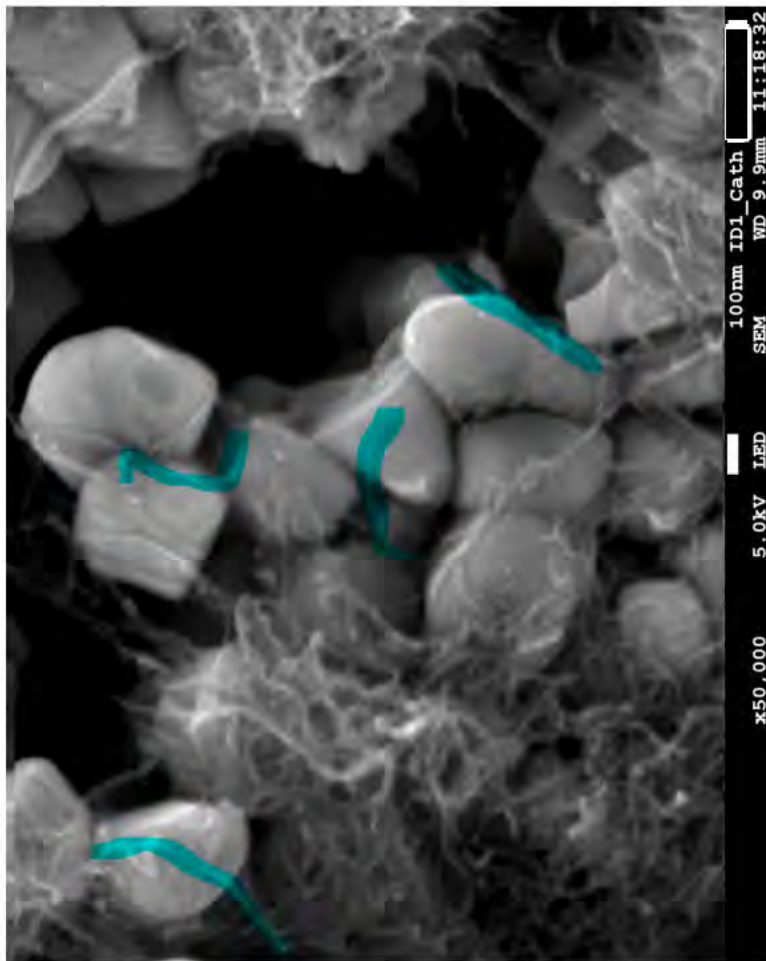
Claim	Contention
	LG G8 Cellphone Battery ('19):  EDS Layered Image 1
8 A composition useful for lithium-ion batteries comprising:	To the extent that the preamble is limiting, it is met by the '483 Accused Products, each of which comprises "[a] composition useful for lithium-ion batteries." Specifically, each of the '483 Accused Products is a battery that comprises lithium-ion cells and/or pouches. For example, LG has stated that "the two most widely used mixtures are NCM (<u>Li</u>, O, Ni, Co, Mn) and NCA (<u>Li</u>, Ni, Co, Al, O)." https://blog.lgchem.com/en/2023/05/31_cathode_material/. Further, LG also utilizes a mixture comprised of LCO (<u>Li</u>, Co, O) and LFP (<u>Li</u>, Iron, Phosphate). Examples of such batteries are depicted below. LG HG2:

Claim	Contention
	 LG HG6:  LG MJ1:  LG Gram Laptop ('22):  LG E78 eVehicle/ESS Pouch:

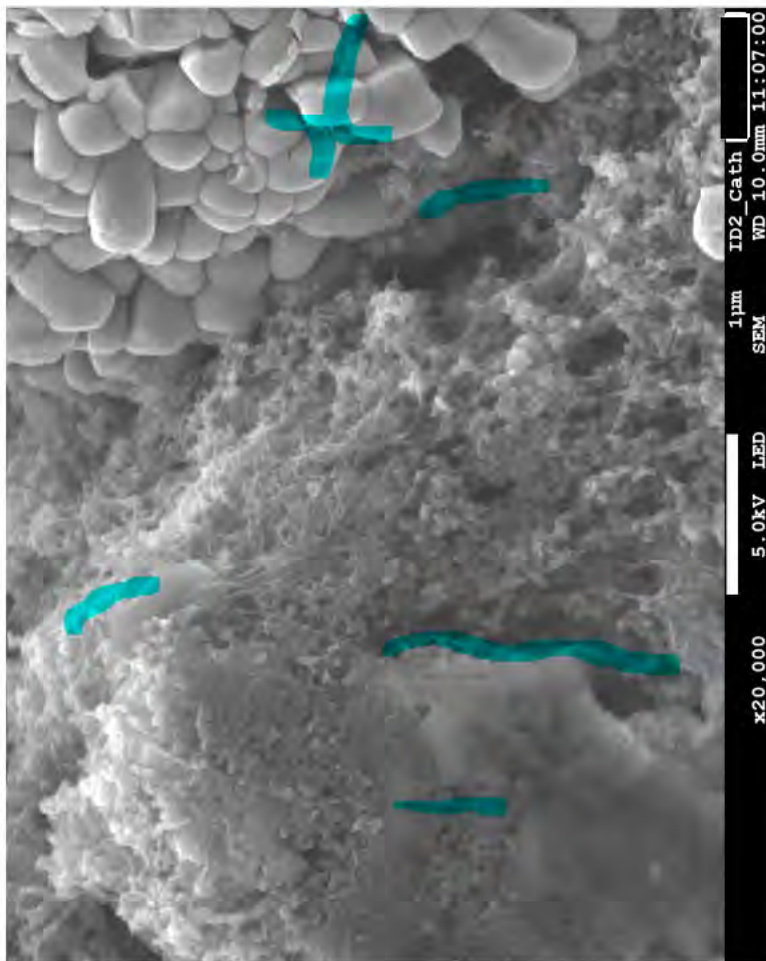
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

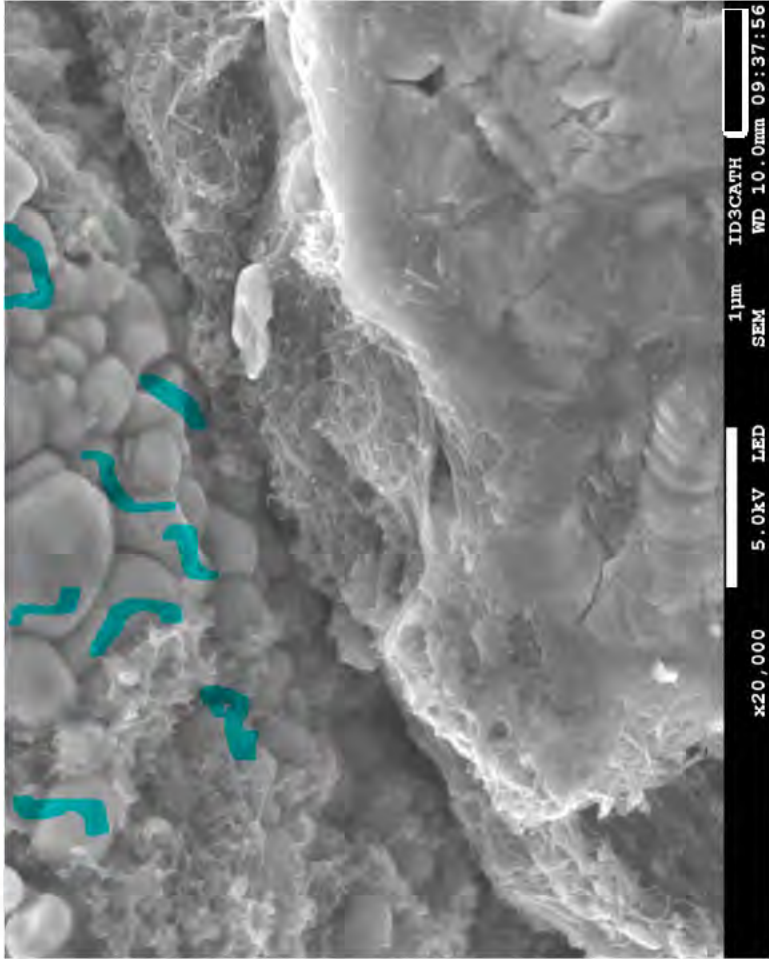
Claim	Contention
	 LG Gram Laptop ('19):  LG G8 Cellphone Battery ('19):  This element is met by the '483 Accused Products, each of which comprises “oxidized discrete, non-agglomerated, and exfoliated carbon nanotubes having a surface.” Specifically, each of the '483 Accused Products comprises discrete, non-agglomerated, and exfoliated carbon nanotubes that have at least one surface.

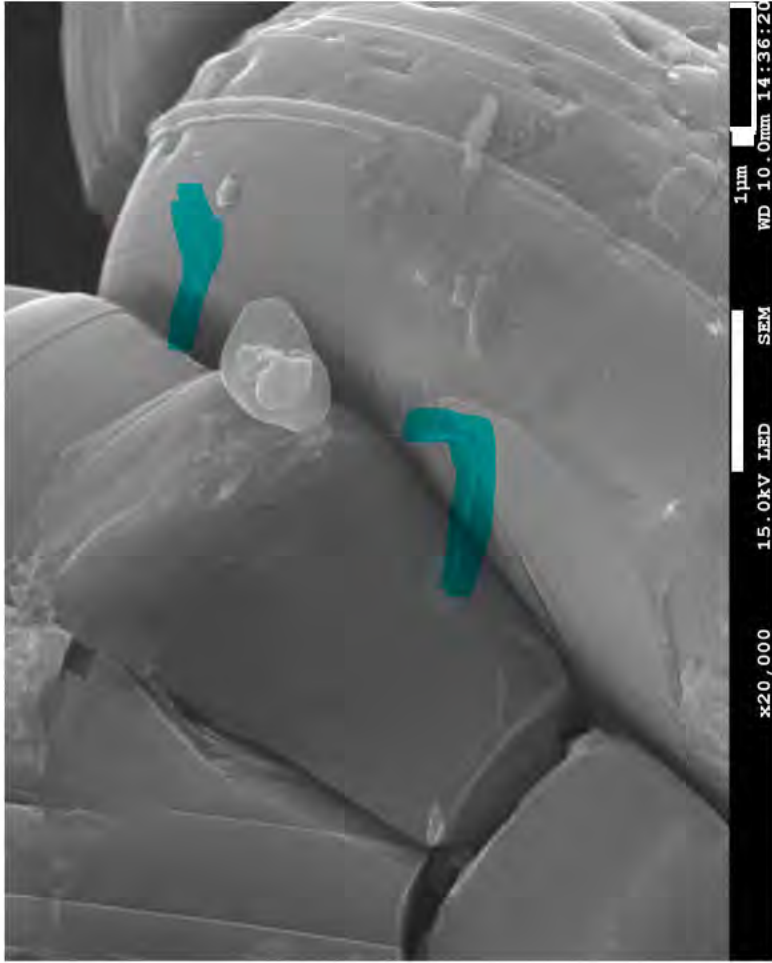
This is demonstrated by the below, which reflects that HG2 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface.

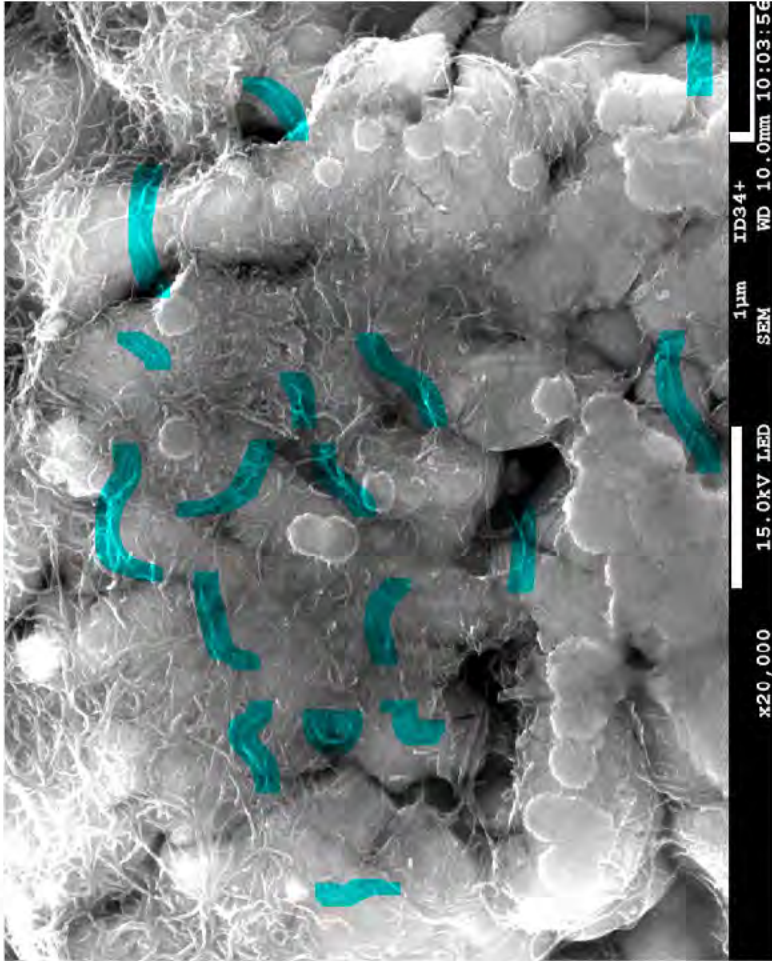


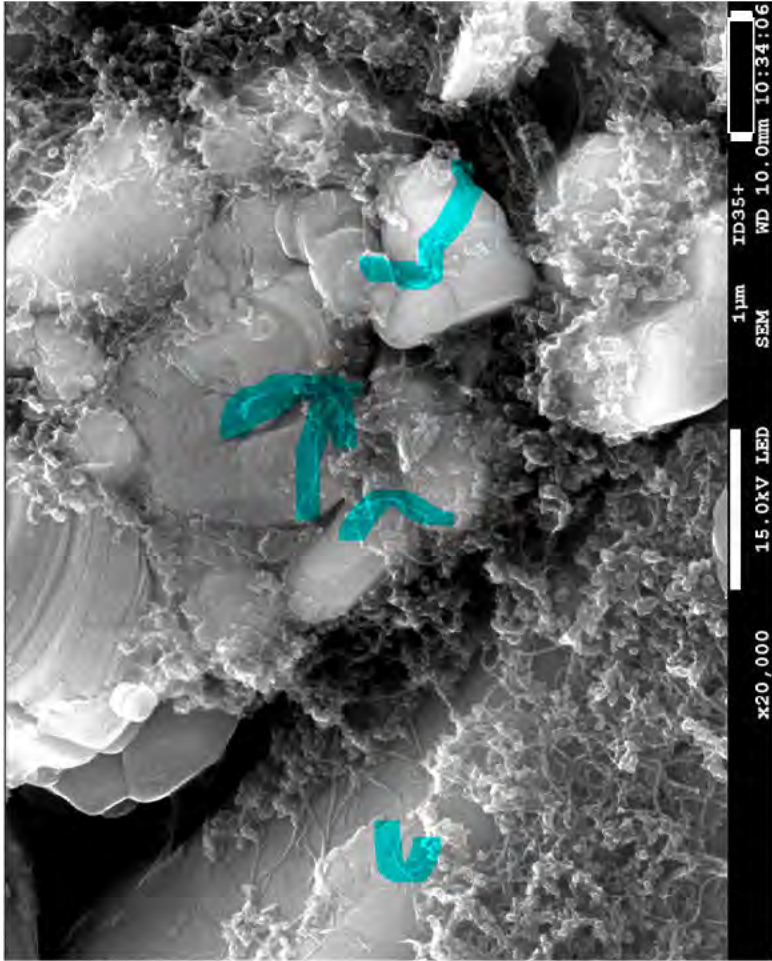
As another example, as depicted below, HG6 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface.



Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 

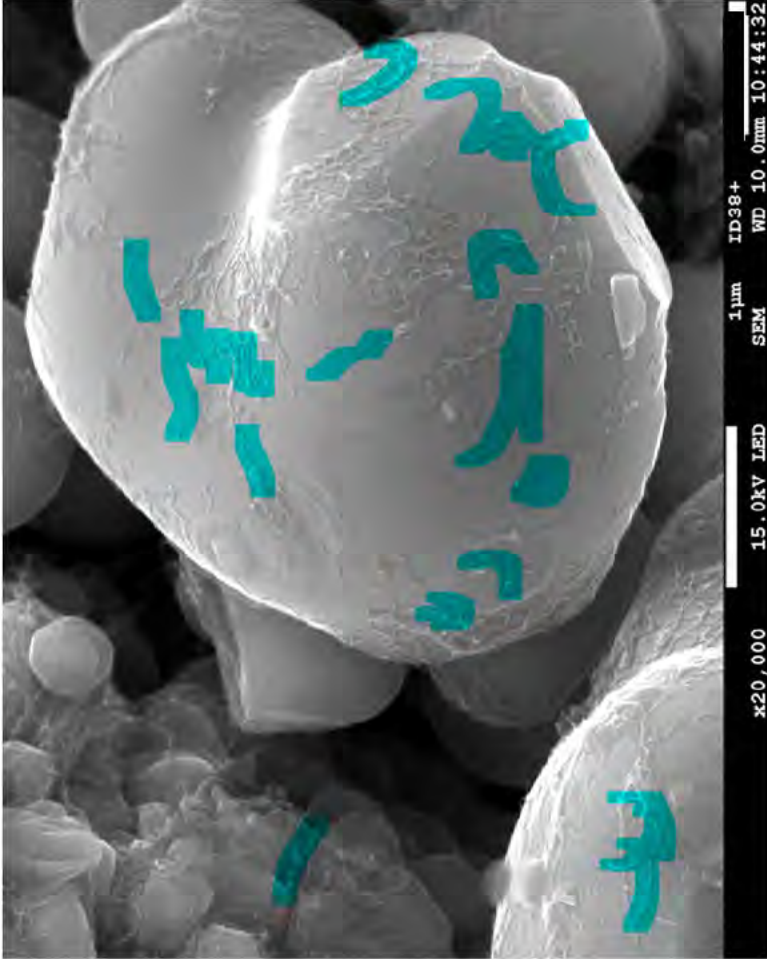
Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 

Claim	Contention
	As another example, as depicted below, E78 comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 

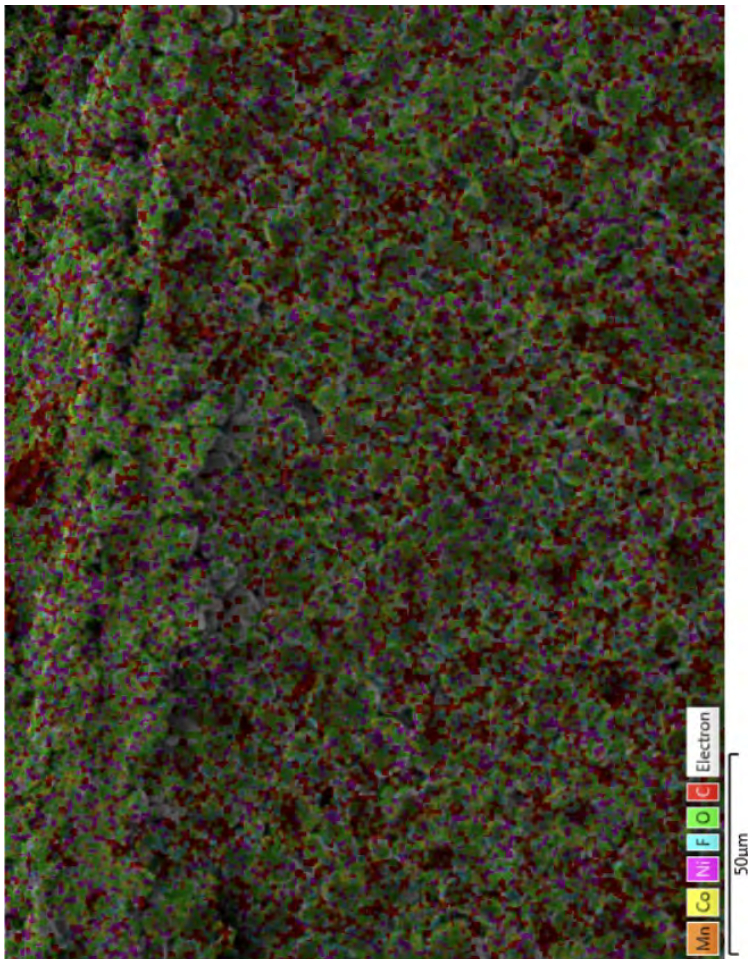
Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface. 

Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)

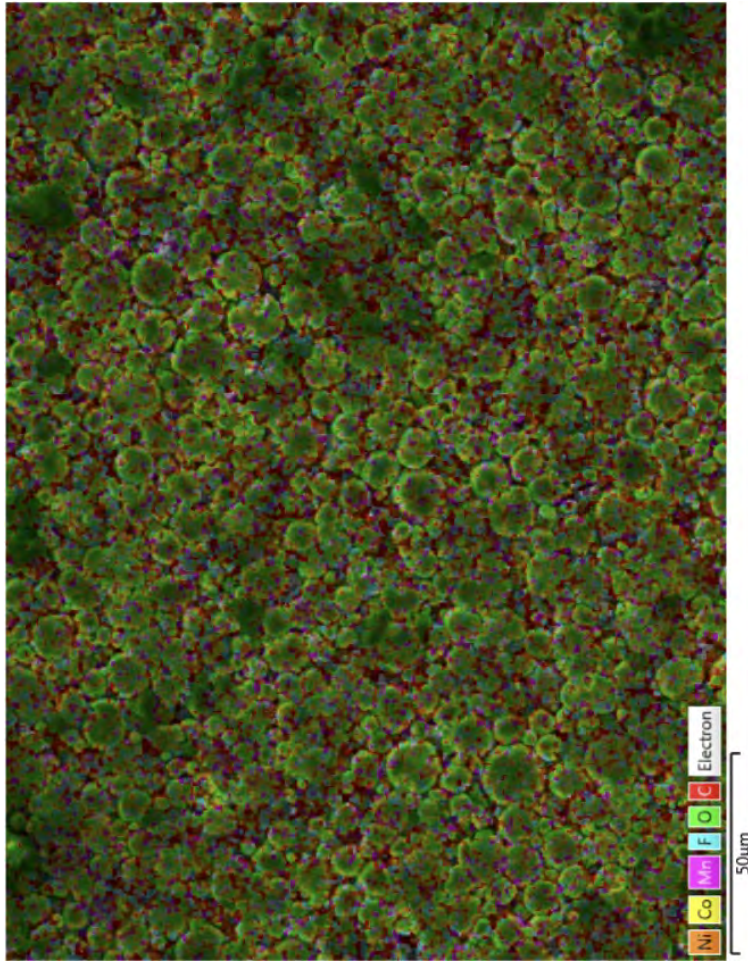
Infringement of U.S. Patent No. 10,153,483

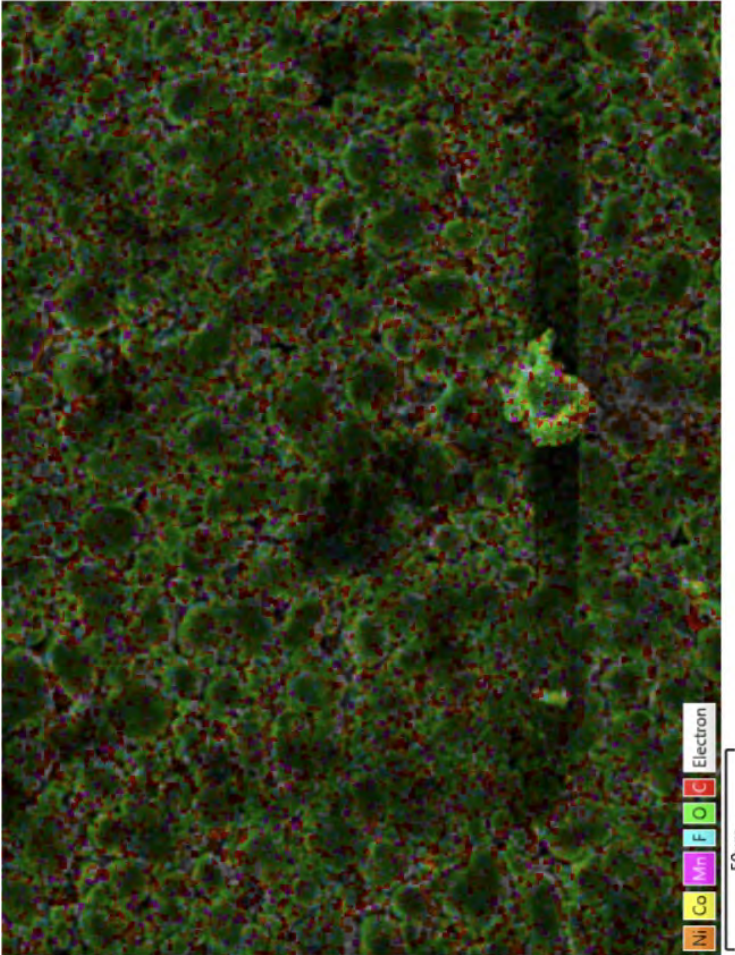
Claim	Contention
	As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete, non-agglomerated, and exfoliated carbon nanotubes (highlighted in blue) that have at least one surface.  Further, such carbon nanotubes are oxidized. This is demonstrated in part by the below, which reflects the presence of oxygen in each sample.

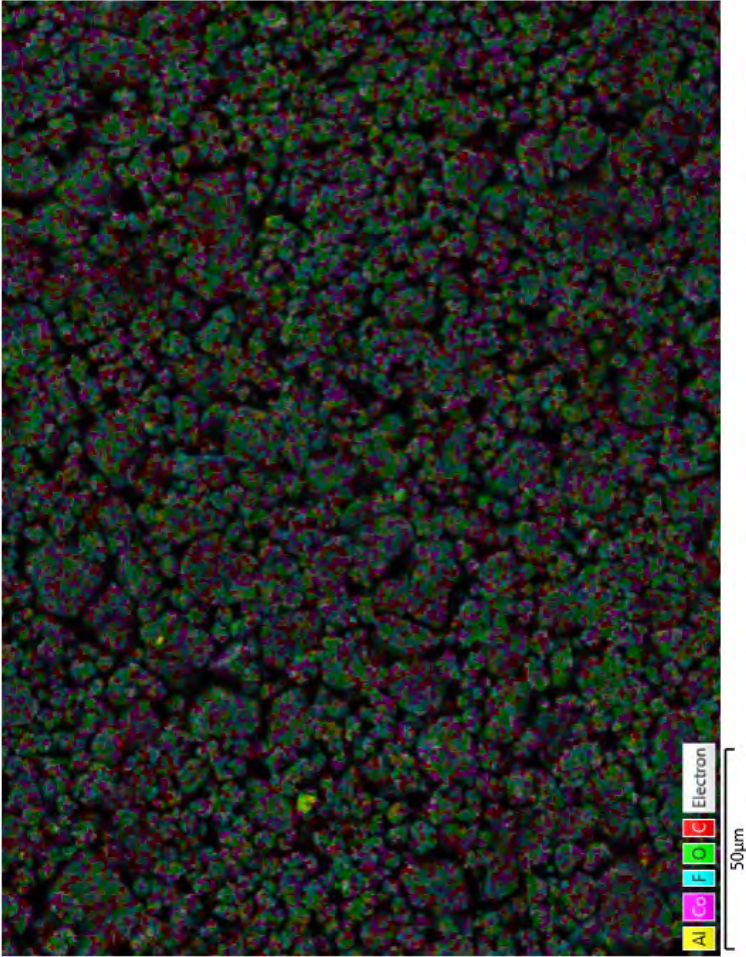
HG2

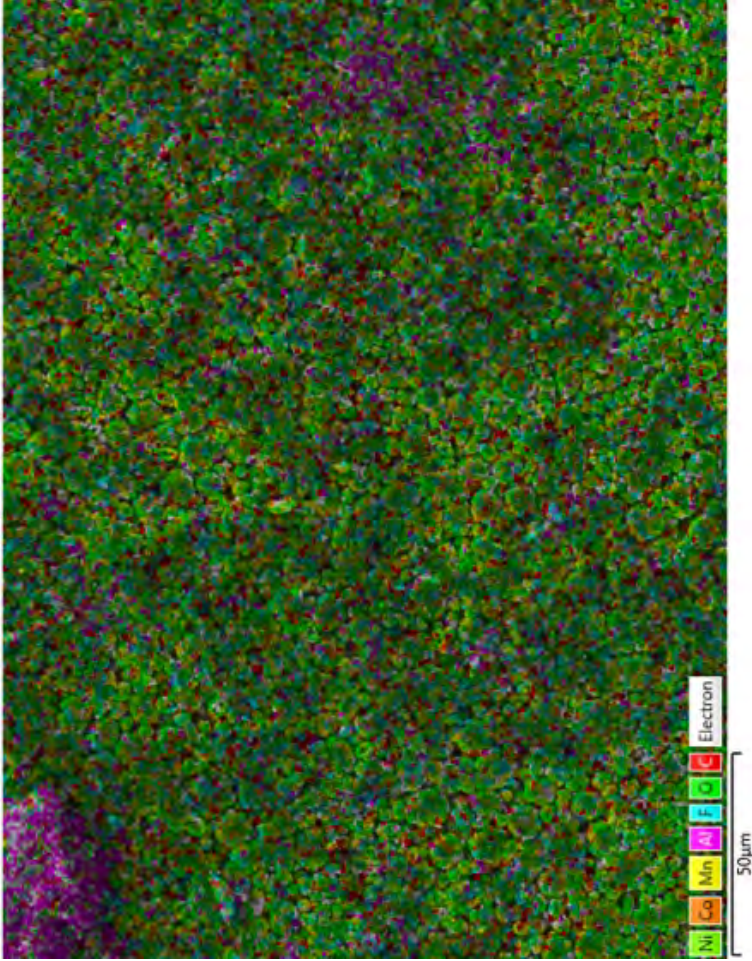


HG6

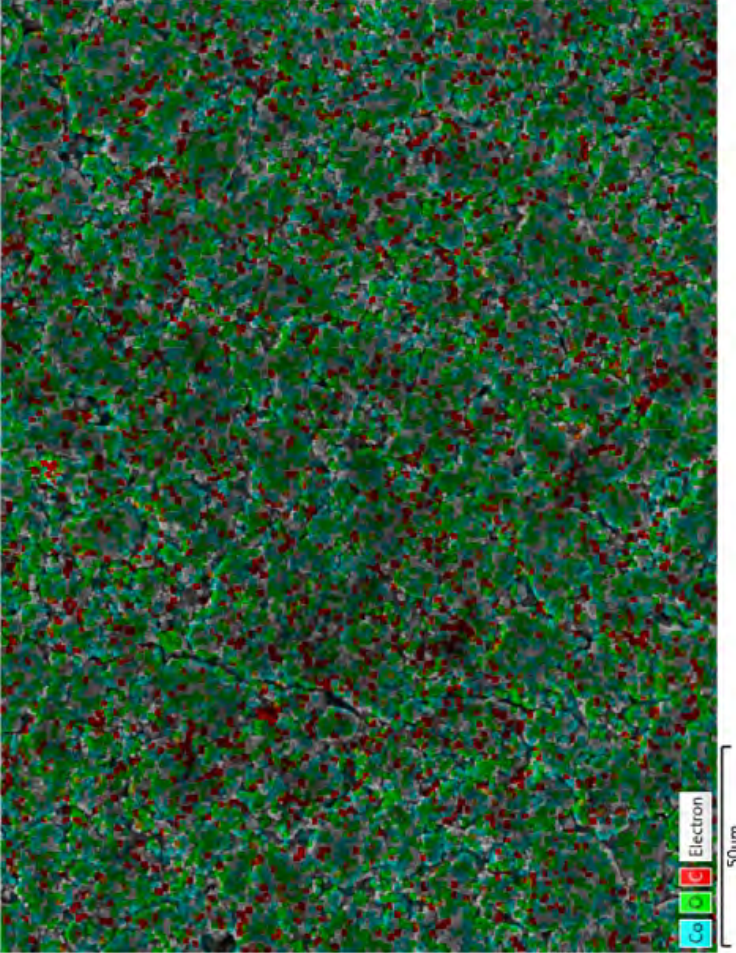


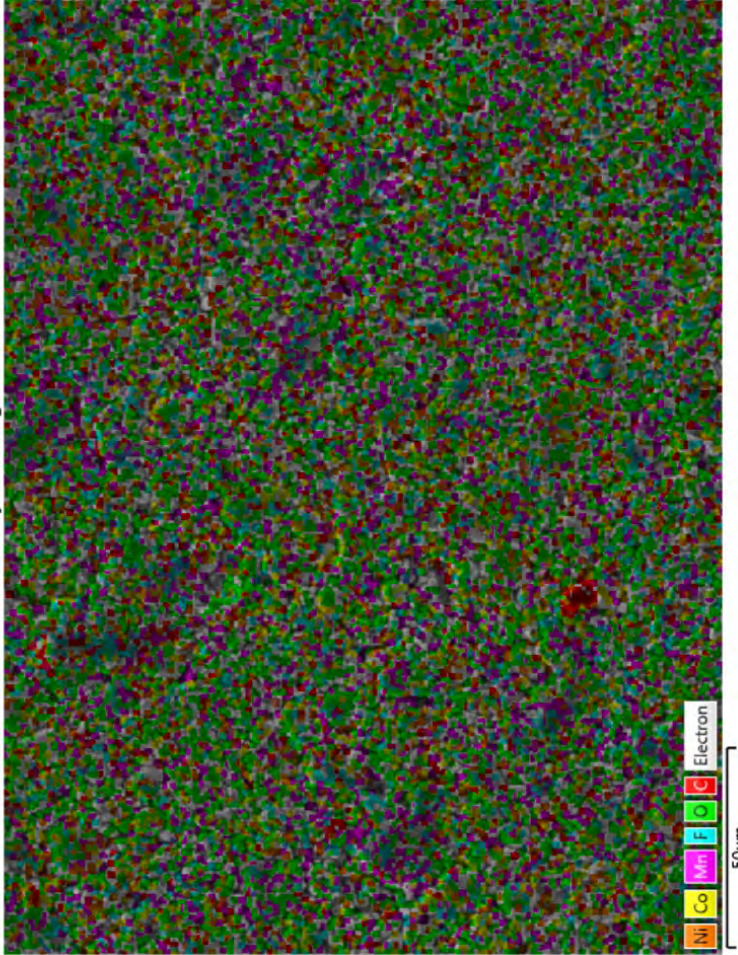
Claim		Contention
		MJ1 

Claim		Contention
		LG Gram Laptop ('22): EDS Layered Image 1  The image is an EDS Layered Image showing a microscopic view of a material surface. The surface is covered with a dense, granular texture. A scale bar in the bottom right corner indicates a length of 50µm. A legend in the bottom right corner identifies the elements: Al (yellow), Co (magenta), F (cyan), C (red), and Electron (white). The image is labeled 'EDS Layered Image 1' and is associated with the 'LG Gram Laptop ('22)'.

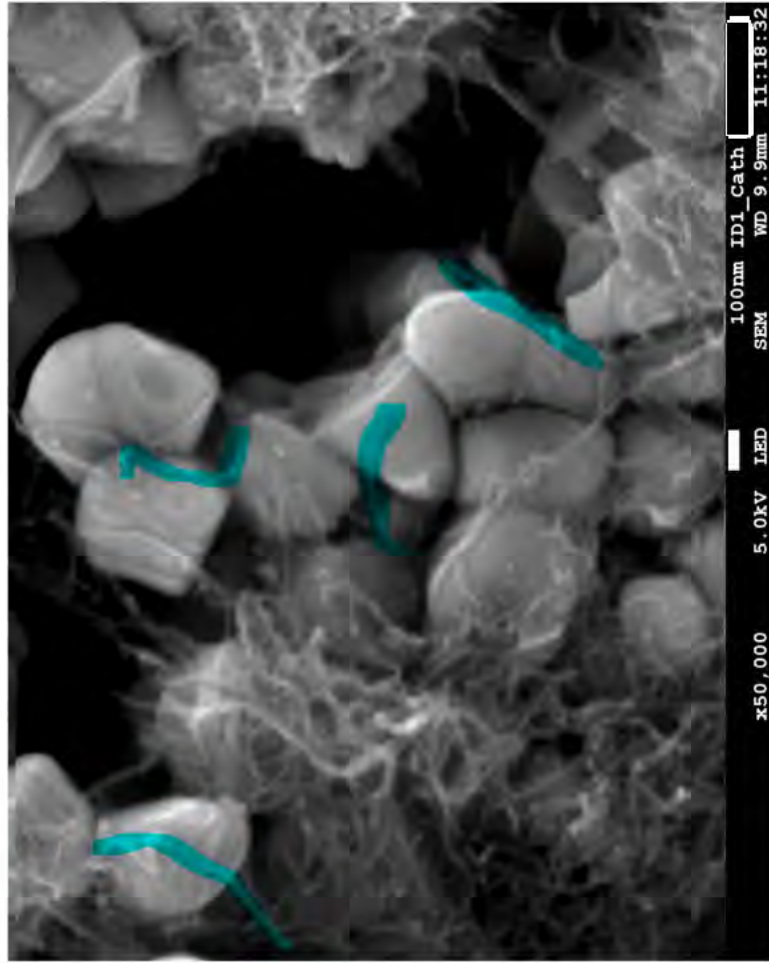
Claim		Contention
		LG E78 eVehicle/ESS Pouch: EDS Layered Image 2  The image is a cross-sectional view of a material, likely a battery pouch, showing a granular, layered structure. The colors represent different elements: Ni (blue), Co (orange), Mn (yellow), F (green), C (red), and Electron (purple). A scale bar at the bottom indicates 50µm.

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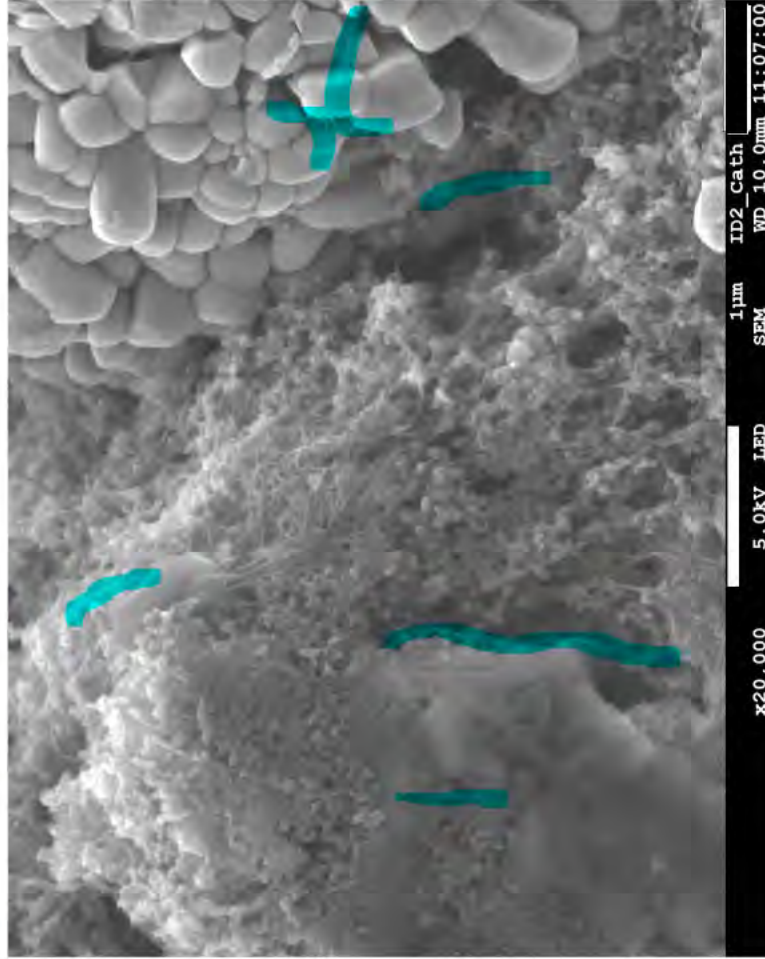
Claim	Contention
	LG Gram Laptop ('19): EDS Layered Image 3  50µm Co C Electron LG G8 Cellphone Battery ('19):

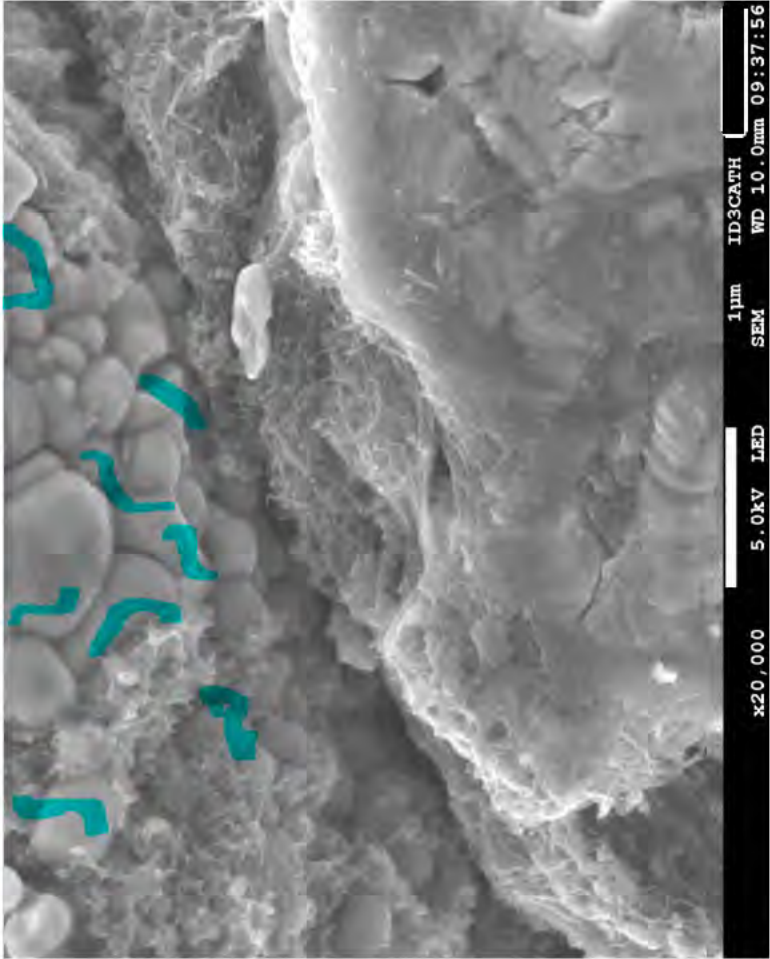
Claim	Contention
	EDS Layered Image 1 
and mixtures of ion active materials comprising migratable ions[,] said materials comprising crystals or layers of lithium ion active material	This element is met by the '483 Accused Products, each of which comprises "mixtures of ion active materials comprising migratable ions[,] said materials comprising crystals or layers of lithium ion active material." Specifically, each of the '483 Accused Products comprises mixtures of ion active materials comprising migratable ions, such as those comprising the electrolyte (e.g., Li+ / PF6-). Further, said materials comprise crystals of lithium-ion active material, including crystals comprised of NCM, NCA, LCO, and/or LFP.

This is demonstrated by the below, which reflects that HG2 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 400-500 nm (nanoscale) in diameter.

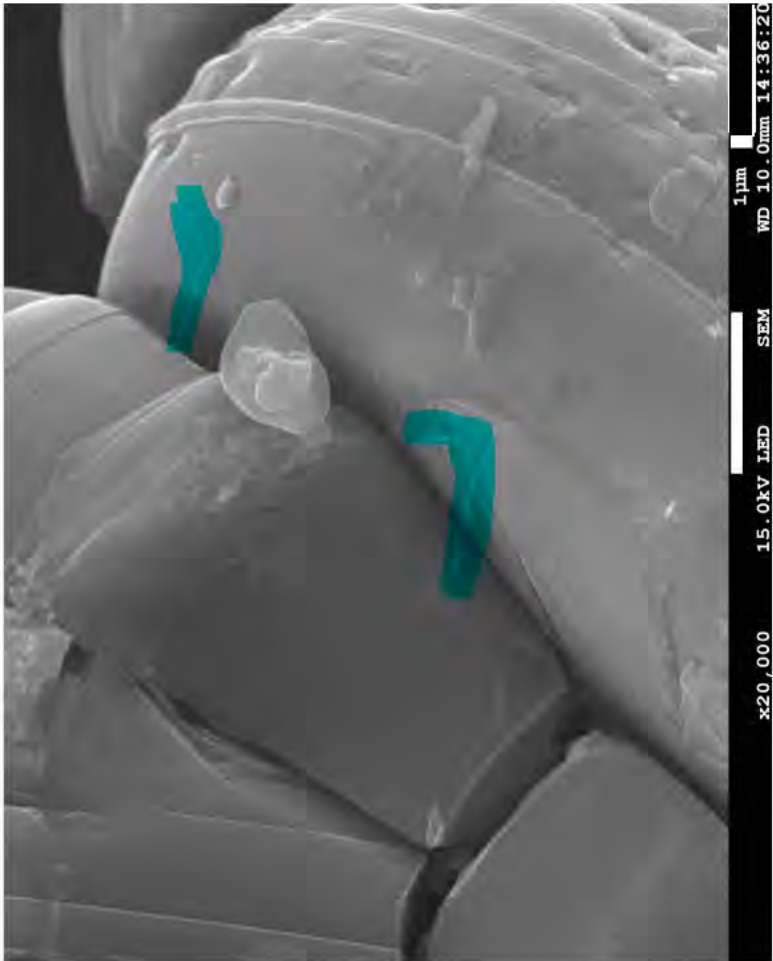


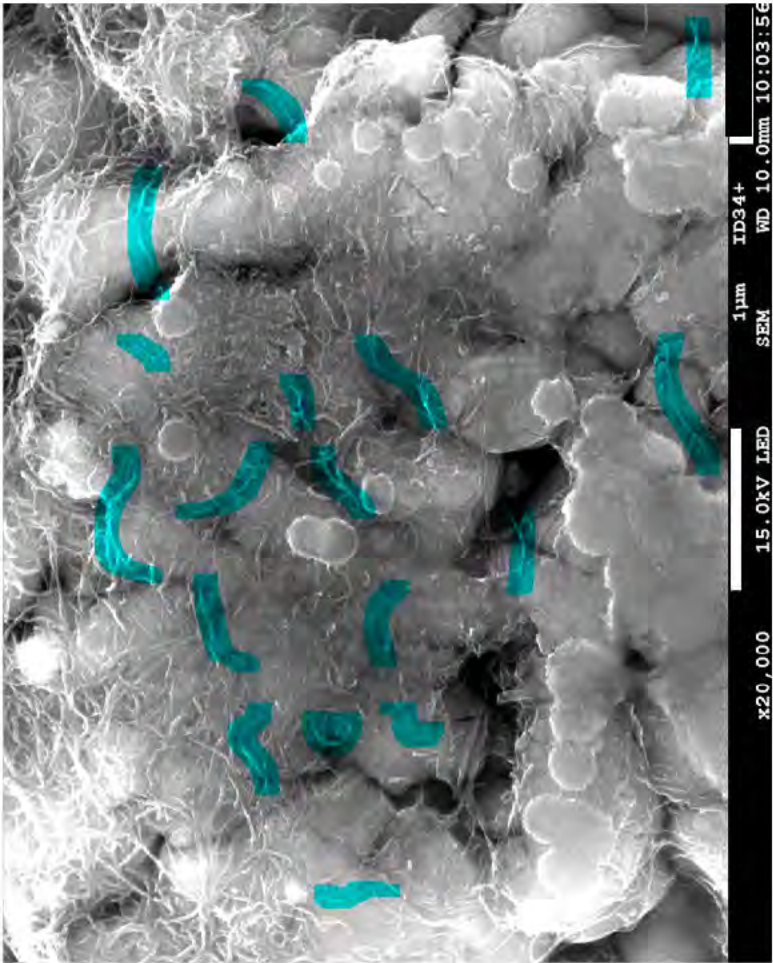
As another example, as depicted below, HG6 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200–400 nm (nanoscale) in diameter.

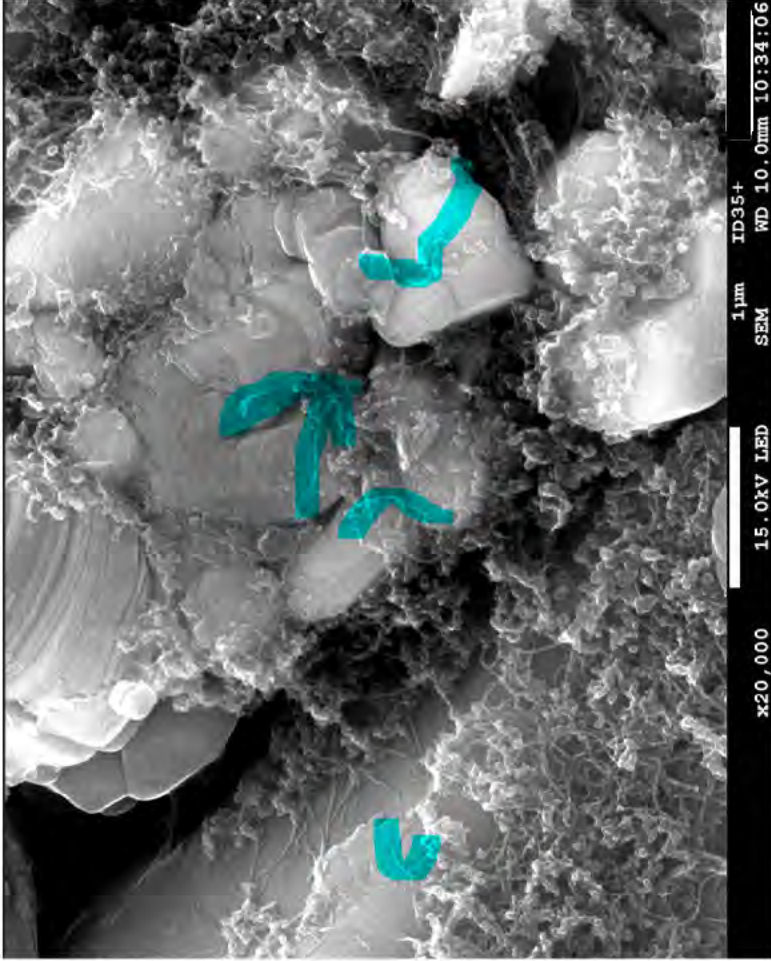


Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

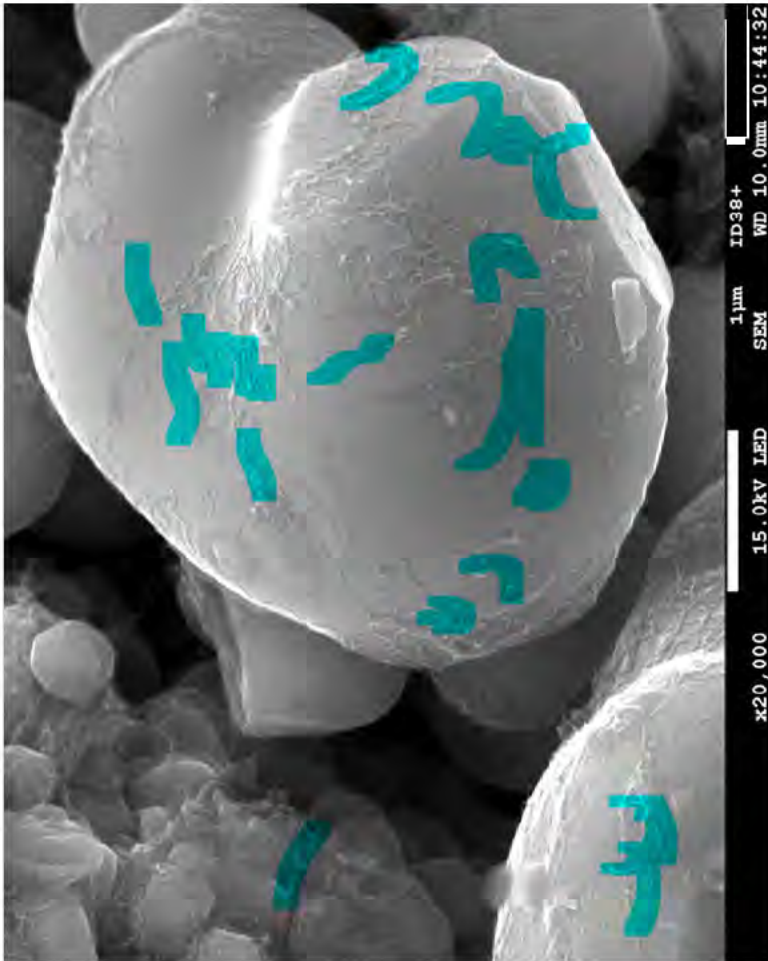
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
Infringement of U.S. Patent No. 10,153,483

Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

Claim	Contention
	As another example, as depicted below, E78 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

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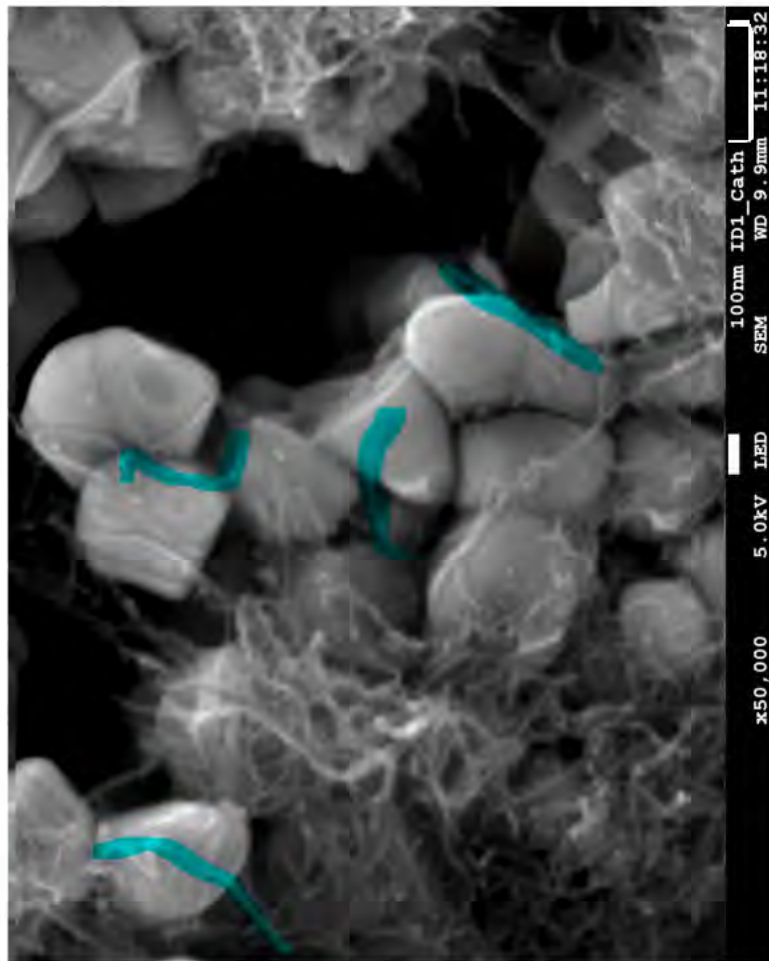
Claim	Contention
	As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals.  x20,000 15.0kV LED 1µm ID38+ SEM WD 10.0mm 10:44:32
wherein a ratio of lithium ion to other total ions in the ion active materials is at least 2:1,	This element is met by the '483 Accused Products, each of which comprises mixtures of ion active materials "wherein a ratio of lithium ion to other total ions in the ion active materials is at least 2:1 to 25:1." For example, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Further, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable

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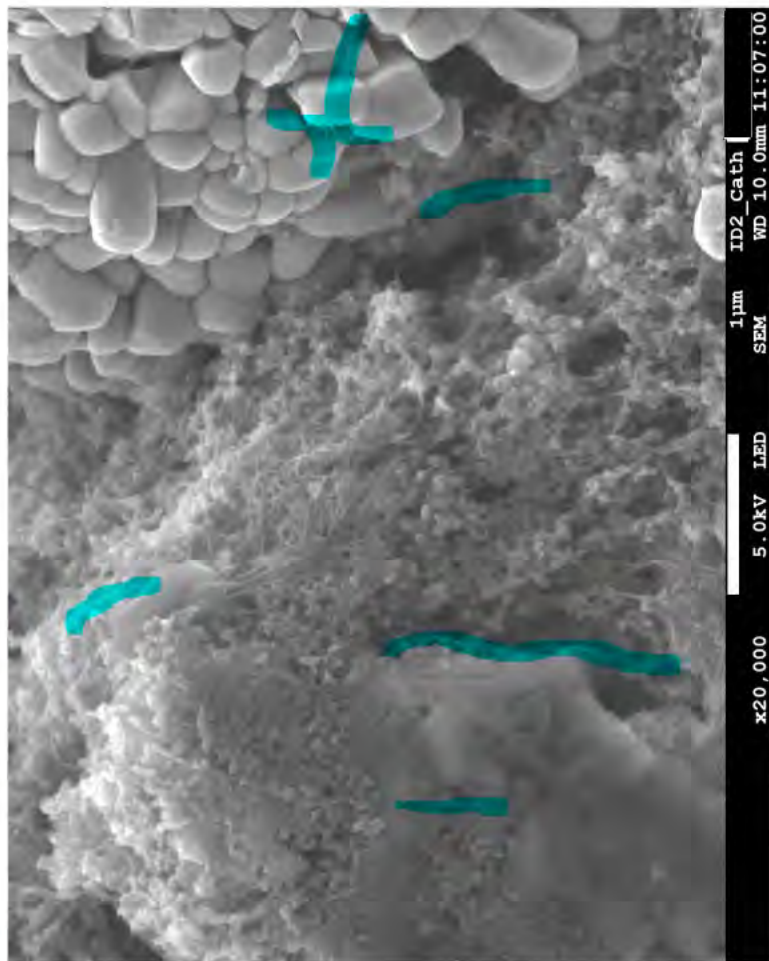
Infringement of U.S. Patent No. 10,153,483

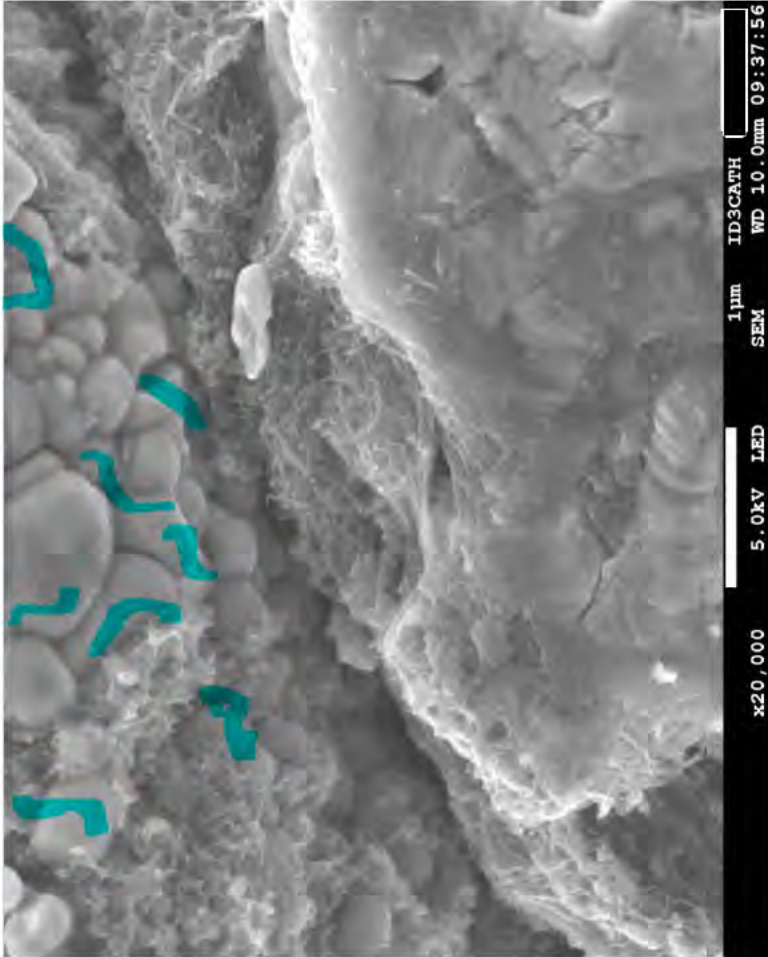
Contention	
	nature of the Li ⁺ , its concentration within the cathode varies during charge and discharge processes but is configured to be within a 2:1 to 25:1 ratio at least when at approximately a 44% to 98% state of charge.
wherein the discrete carbon nanotubes have crystals or layers of lithium ion active materials ionically attached to their surface,	This element is met by the '483 Accused Products, each of which comprises “discrete carbon nanotubes have crystals or layers of lithium ion active material ionically attached to their surface.” Specifically, each of the '483 Accused Products comprises discrete carbon nanotubes have crystals of lithium ion active material ionically attached to their surface.

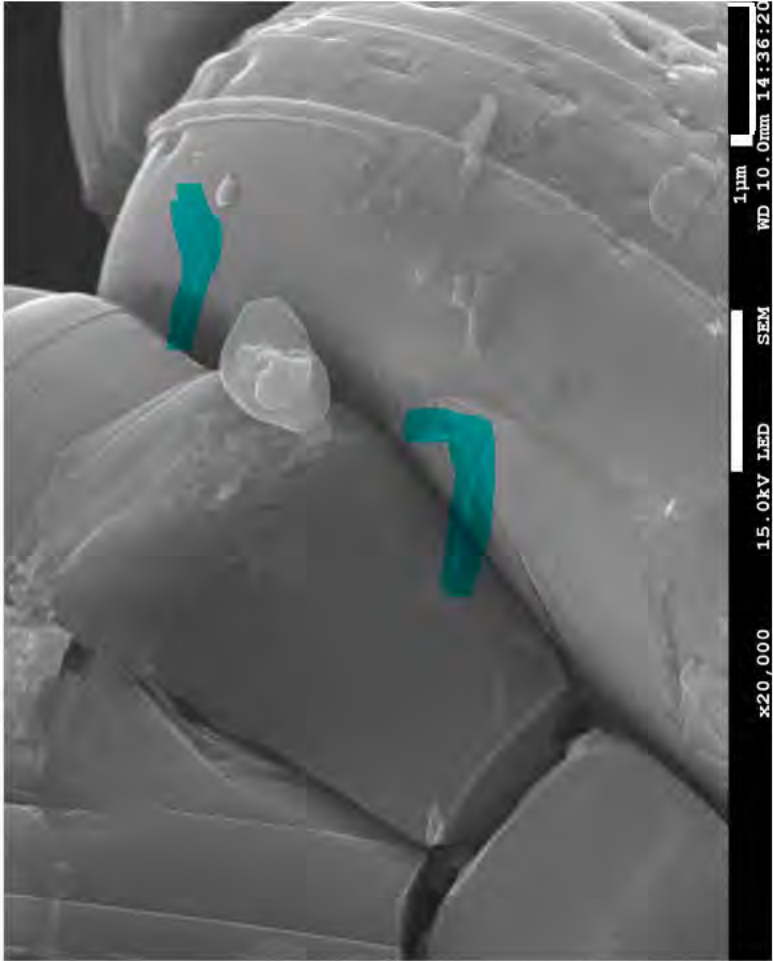
This is demonstrated by the below, which reflects that HG2 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 400-500 nm (nanoscale) in diameter.

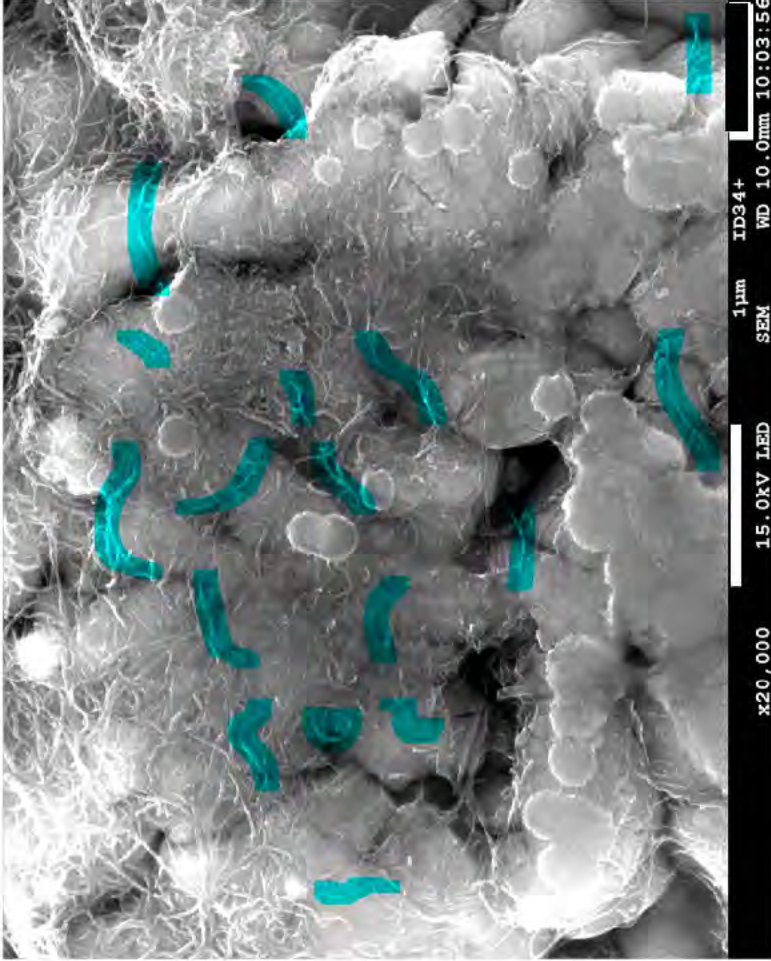


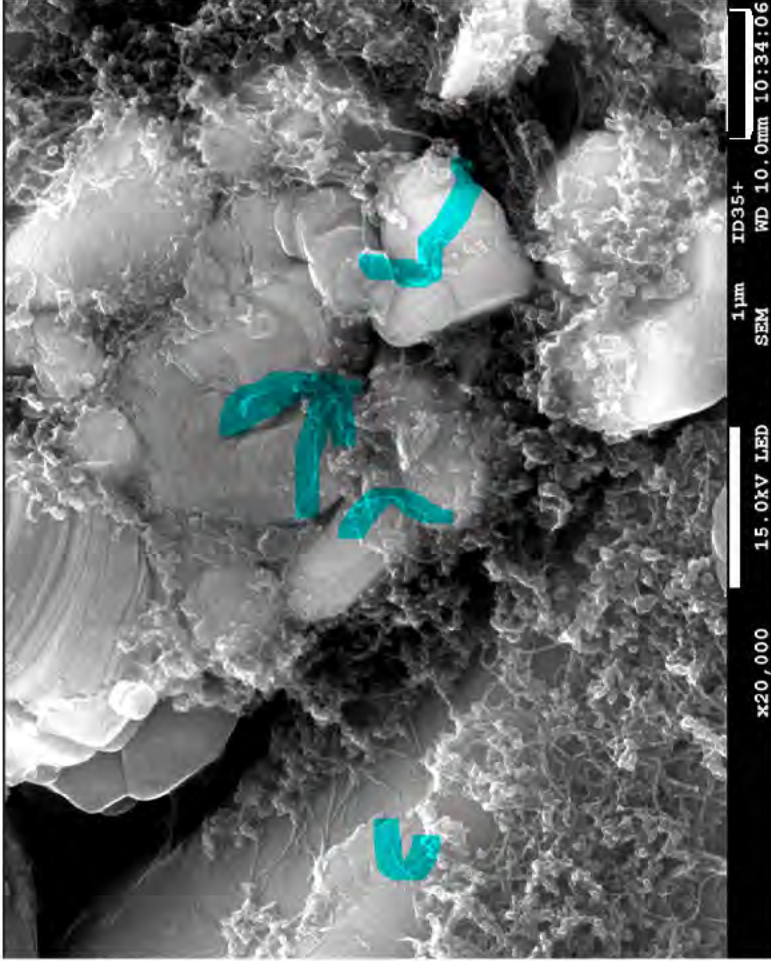
As another example, as depicted below, HG6 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200–400 nm (nanoscale) in diameter.



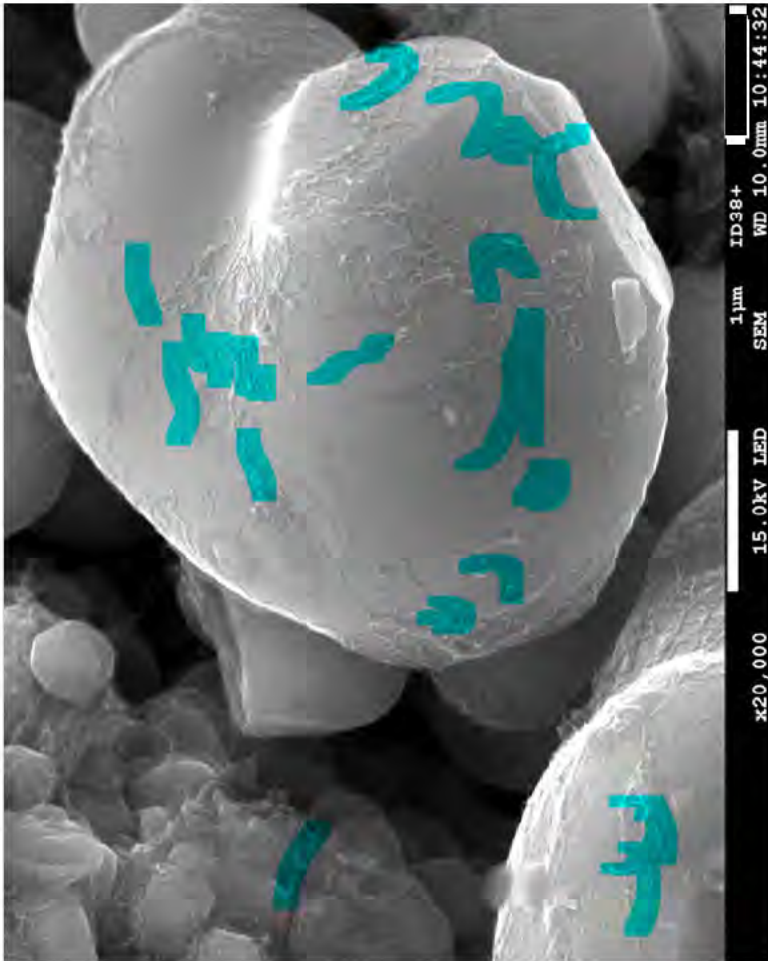
Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

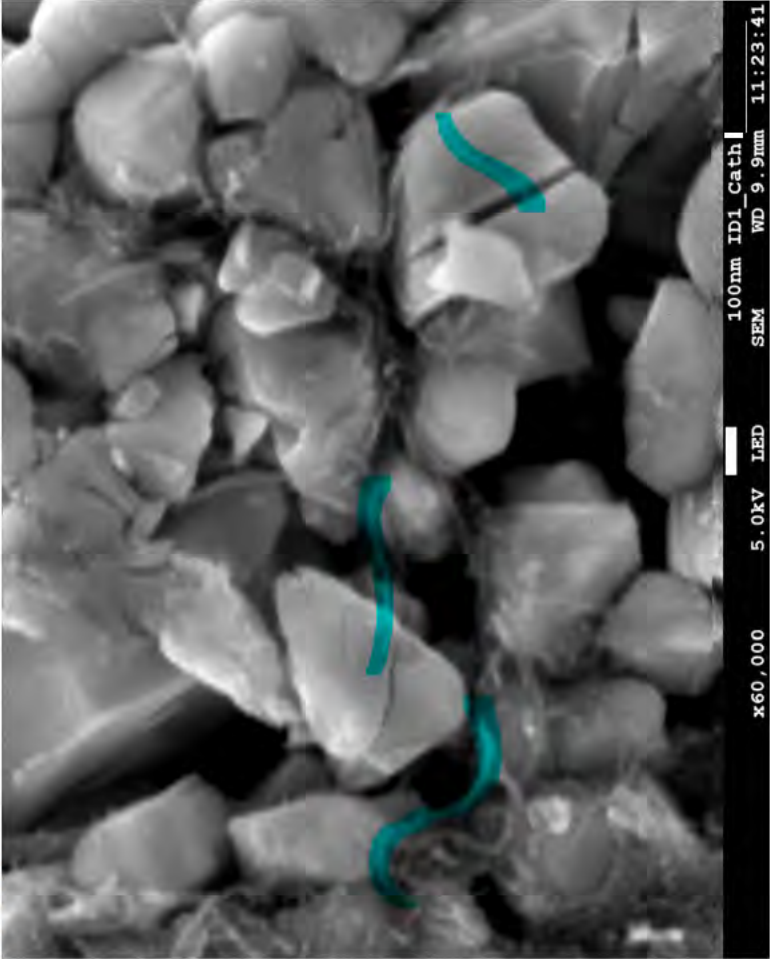
Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

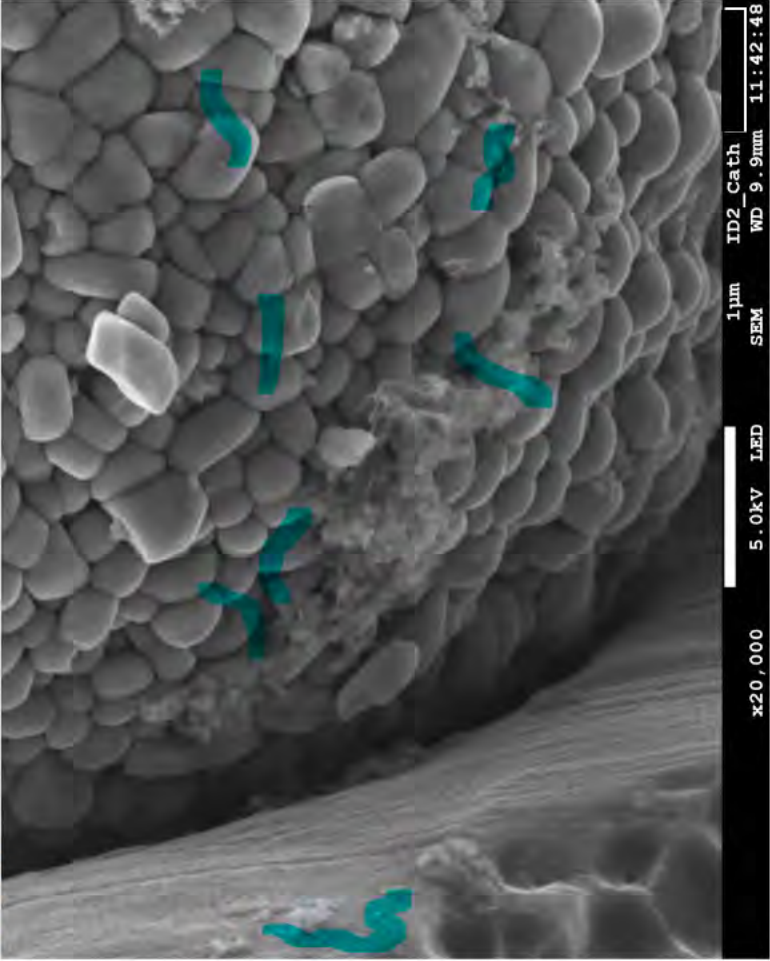
Claim	Contention
	As another example, as depicted below, E78 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

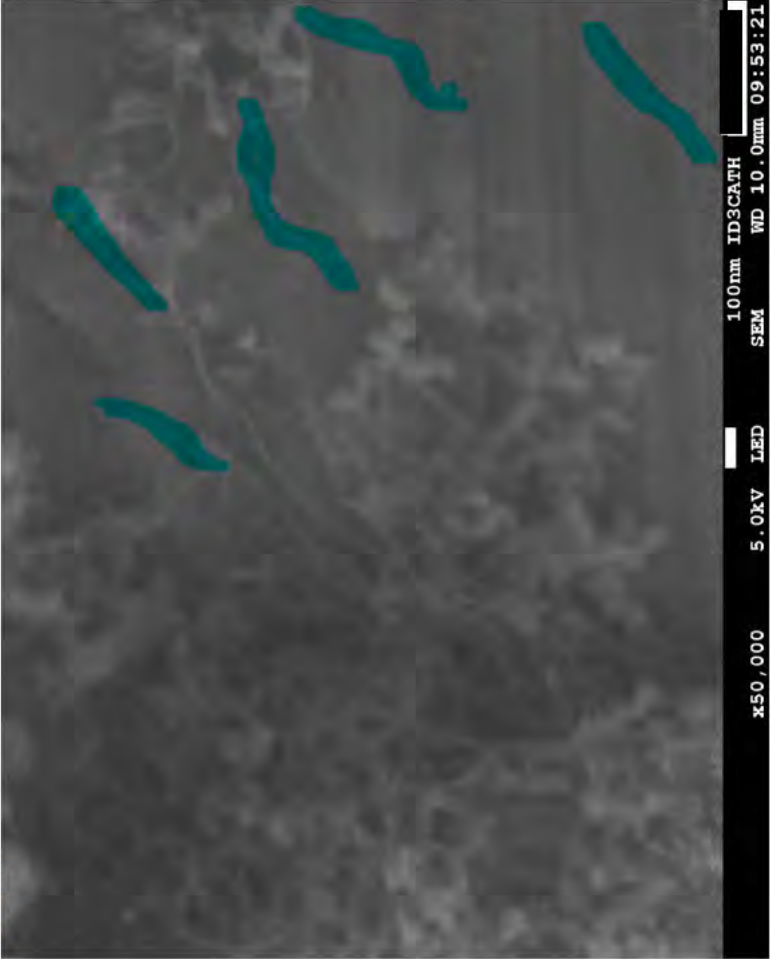
Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

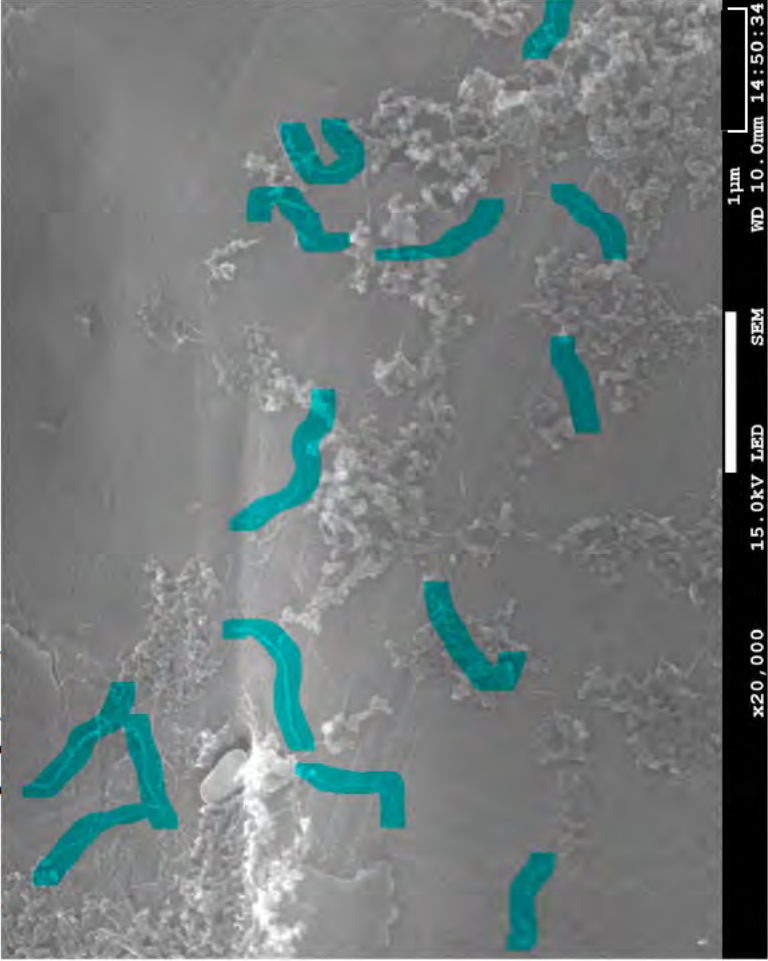
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
Infringement of U.S. Patent No. 10,153,483

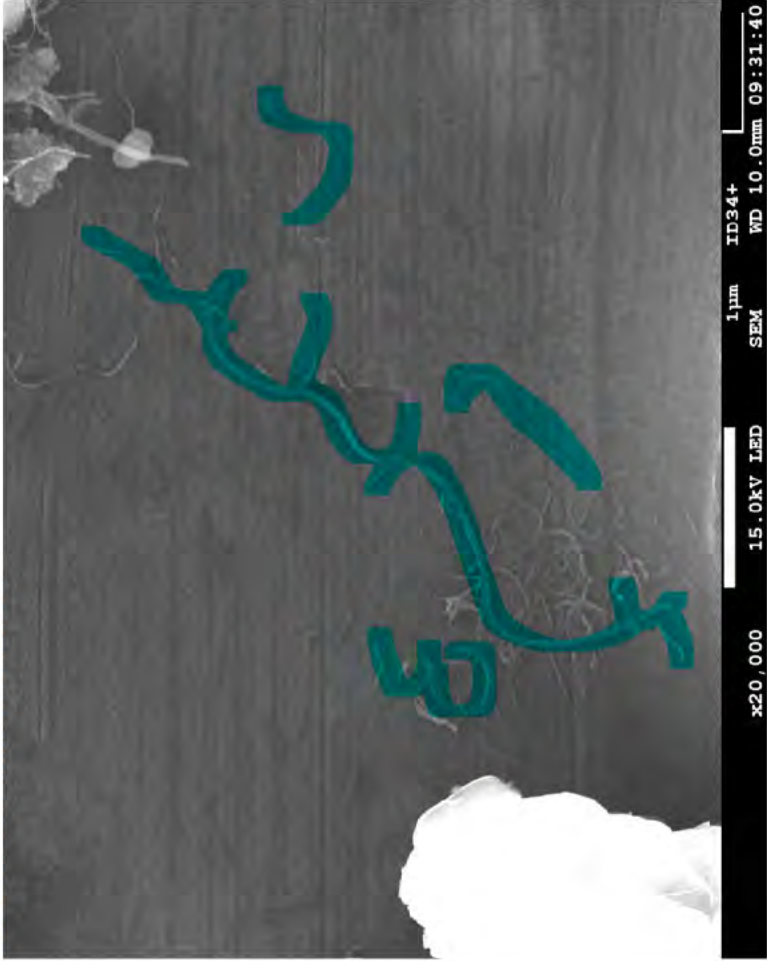
Claim	Contention
	As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals. 
and wherein the carbon nanotubes are uniformly dispersed without clustering on a dimension scale of less than about 1 micrometer	This element is met by the '483 Accused Products, each of which comprises a composition "wherein the carbon nanotubes are uniformly dispersed without clustering on a dimension scale of less than about 1 micrometer." Specifically, as demonstrated at least by portions of the below images highlighted in blue images relating to certain representative '483 Accused Products, each of the '483 Accused Products

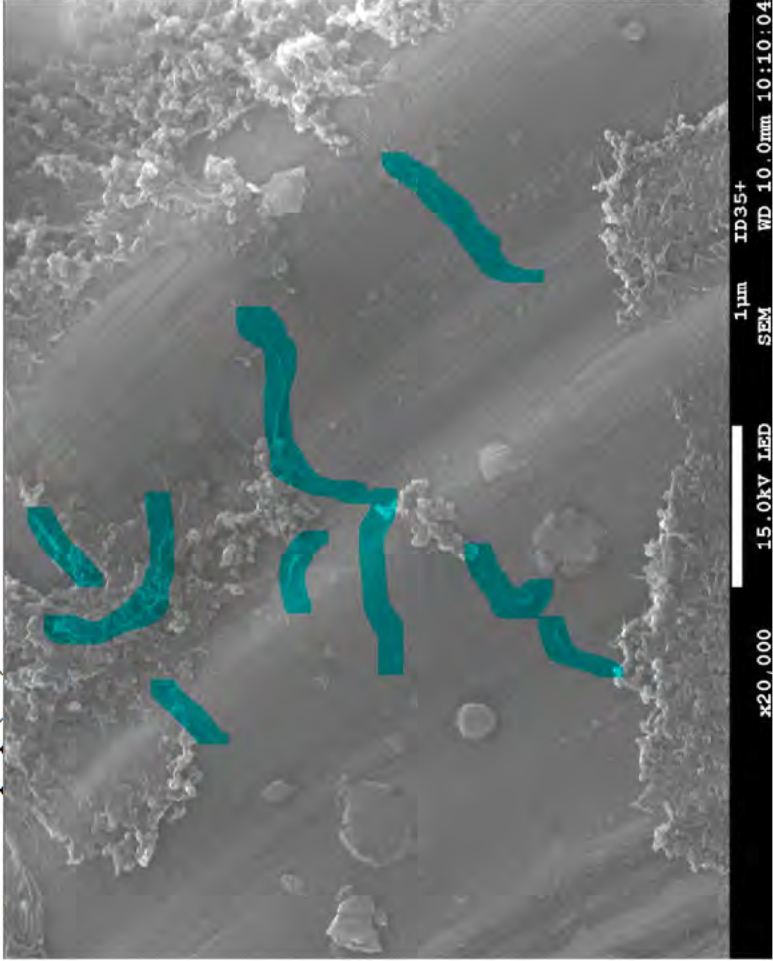
Claim	Contention
	comprises carbon nanotubes uniformly dispersed without clustering on a dimension scale less than 1 micrometer. LG HG2: 

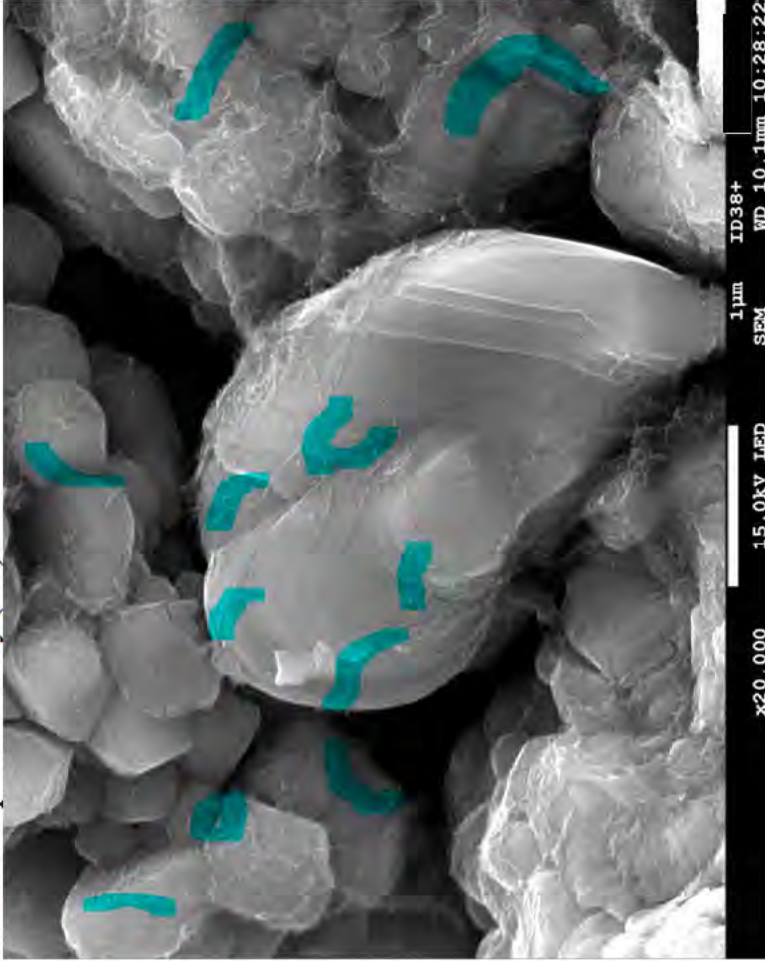
Claim		Contention
		LG HG6: 

Claim		Contention
		LG MJ1: 

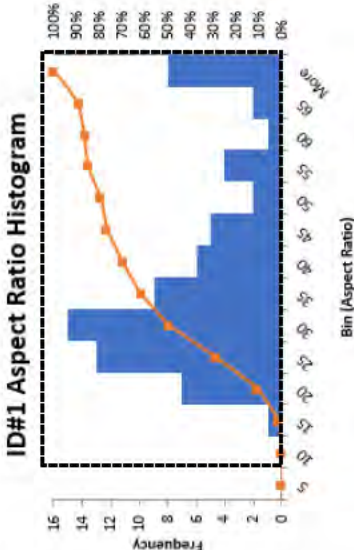
Claim		Contention
		LG Gram Laptop (2022) 

Claim	Contention
LG E78 eVehicle/ESS Pouch:	

Claim	Contention
	LG Gram Laptop ('19): 

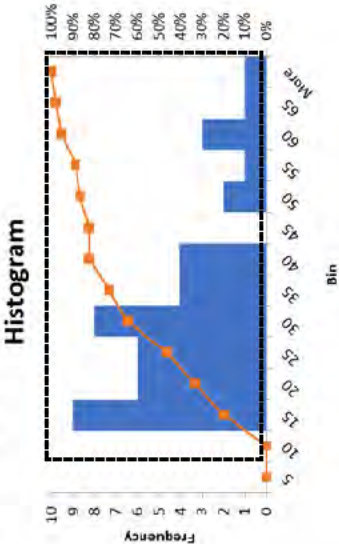
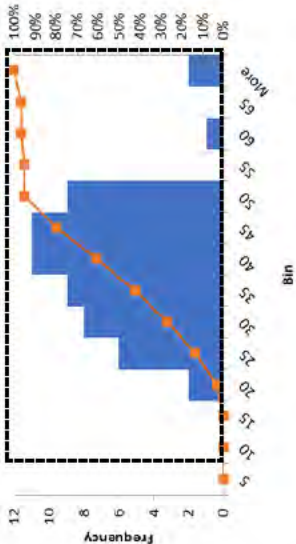
Claim	Contention
	LG G8 Cellphone Battery ('19): 
and wherein the discrete carbon nanotubes comprise oxidized species selected from the group consisting of carboxylic, ketone, or hydroxyl functionalities,	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes "wherein the discrete carbon nanotubes comprise oxidized species selected from the group consisting of carboxylic, ketone, or hydroxyl functionalities." Specifically, each of the '483 Accused Products include discrete carbon nanotubes that comprise carboxylic, ketone, and/or hydroxyl functionalities.

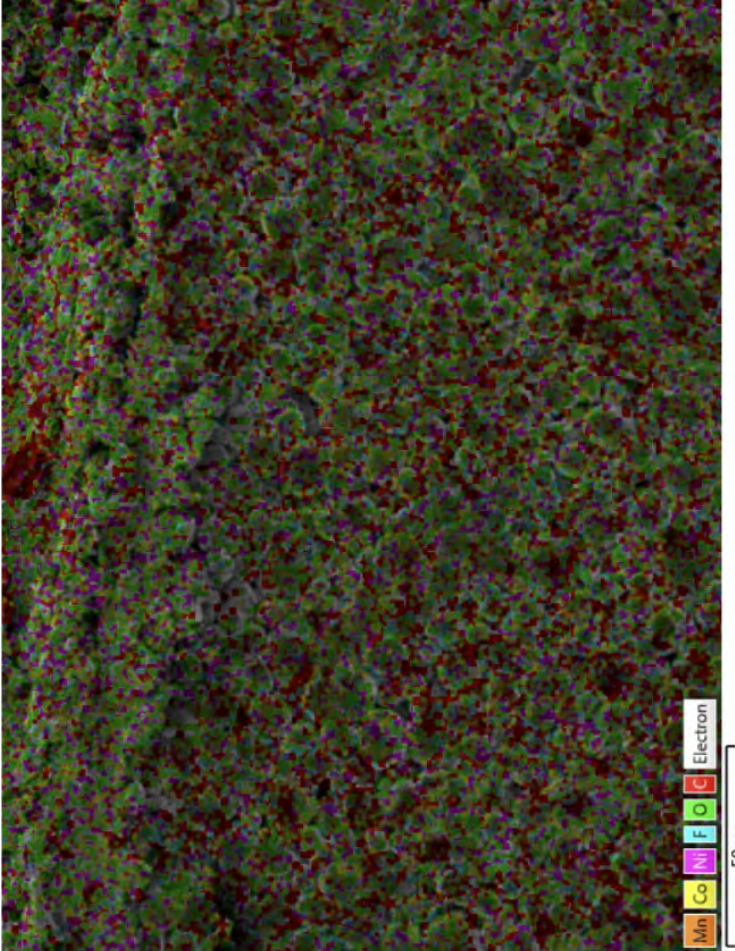
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Claim	Contention																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
and wherein the discrete carbon nanotubes have an aspect ratio of 10 to 500	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes "wherein the discrete carbon nanotubes have an aspect ratio of 10 to 500." Specifically, each of the '483 Accused Products comprises carbon nanotubes having an aspect ratio of between 10 to 500 when its length is divided by its diameter. This is demonstrated by the below images relating to certain representative '483 Accused Products, which reflects that the '483 Accused Products comprise discrete nanotubes with an aspect ratio typically between 10 and 100: HG2  The histogram, titled 'ID#1 Aspect Ratio Histogram', displays the frequency of aspect ratios for a specific sample. The x-axis is labeled 'Bin (Aspect Ratio)' and ranges from 0 to 100, with a final bin labeled 'More'. The y-axis is labeled 'Frequency' and ranges from 0 to 16. The histogram bars are blue. An orange line with square markers represents a cumulative distribution curve, starting at (0,0) and ending at (100,100%). <table border="1"> <caption>Approximate data from ID#1 Aspect Ratio Histogram</caption> <thead> <tr> <th>Bin (Aspect Ratio)</th> <th>Frequency</th> <th>Cumulative %</th> </tr> </thead> <tbody> <tr><td>0-10</td><td>1</td><td>~5%</td></tr> <tr><td>10-20</td><td>2</td><td>~10%</td></tr> <tr><td>20-30</td><td>3</td><td>~15%</td></tr> <tr><td>30-40</td><td>4</td><td>~20%</td></tr> <tr><td>40-50</td><td>5</td><td>~25%</td></tr> <tr><td>50-60</td><td>6</td><td>~30%</td></tr> <tr><td>60-70</td><td>7</td><td>~35%</td></tr> <tr><td>70-80</td><td>8</td><td>~40%</td></tr> <tr><td>80-90</td><td>9</td><td>~45%</td></tr> <tr><td>90-100</td><td>10</td><td>~50%</td></tr> <tr><td>100-110</td><td>11</td><td>~55%</td></tr> <tr><td>110-120</td><td>12</td><td>~60%</td></tr> <tr><td>120-130</td><td>13</td><td>~65%</td></tr> <tr><td>130-140</td><td>14</td><td>~70%</td></tr> <tr><td>140-150</td><td>15</td><td>~75%</td></tr> <tr><td>150-160</td><td>16</td><td>~80%</td></tr> <tr><td>160-170</td><td>15</td><td>~85%</td></tr> <tr><td>170-180</td><td>14</td><td>~90%</td></tr> <tr><td>180-190</td><td>13</td><td>~95%</td></tr> <tr><td>190-200</td><td>12</td><td>~100%</td></tr> <tr><td>200-210</td><td>11</td><td>~100%</td></tr> <tr><td>210-220</td><td>10</td><td>~100%</td></tr> <tr><td>220-230</td><td>9</td><td>~100%</td></tr> <tr><td>230-240</td><td>8</td><td>~100%</td></tr> <tr><td>240-250</td><td>7</td><td>~100%</td></tr> <tr><td>250-260</td><td>6</td><td>~100%</td></tr> <tr><td>260-270</td><td>5</td><td>~100%</td></tr> <tr><td>270-280</td><td>4</td><td>~100%</td></tr> <tr><td>280-290</td><td>3</td><td>~100%</td></tr> <tr><td>290-300</td><td>2</td><td>~100%</td></tr> <tr><td>300-310</td><td>1</td><td>~100%</td></tr> <tr><td>310-320</td><td>0</td><td>~100%</td></tr> <tr><td>320-330</td><td>0</td><td>~100%</td></tr> <tr><td>330-340</td><td>0</td><td>~100%</td></tr> <tr><td>340-350</td><td>0</td><td>~100%</td></tr> <tr><td>350-360</td><td>0</td><td>~100%</td></tr> <tr><td>360-370</td><td>0</td><td>~100%</td></tr> <tr><td>370-380</td><td>0</td><td>~100%</td></tr> <tr><td>380-390</td><td>0</td><td>~100%</td></tr> <tr><td>390-400</td><td>0</td><td>~100%</td></tr> <tr><td>400-410</td><td>0</td><td>~100%</td></tr> <tr><td>410-420</td><td>0</td><td>~100%</td></tr> <tr><td>420-430</td><td>0</td><td>~100%</td></tr> <tr><td>430-440</td><td>0</td><td>~100%</td></tr> <tr><td>440-450</td><td>0</td><td>~100%</td></tr> <tr><td>450-460</td><td>0</td><td>~100%</td></tr> <tr><td>460-470</td><td>0</td><td>~100%</td></tr> <tr><td>470-480</td><td>0</td><td>~100%</td></tr> <tr><td>480-490</td><td>0</td><td>~100%</td></tr> <tr><td>490-500</td><td>0</td><td>~100%</td></tr> <tr><td>500-510</td><td>0</td><td>~100%</td></tr> <tr><td>510-520</td><td>0</td><td>~100%</td></tr> <tr><td>520-530</td><td>0</td><td>~100%</td></tr> <tr><td>530-540</td><td>0</td><td>~100%</td></tr> <tr><td>540-550</td><td>0</td><td>~100%</td></tr> <tr><td>550-560</td><td>0</td><td>~100%</td></tr> <tr><td>560-570</td><td>0</td><td>~100%</td></tr> <tr><td>570-580</td><td>0</td><td>~100%</td></tr> <tr><td>580-590</td><td>0</td><td>~100%</td></tr> <tr><td>590-600</td><td>0</td><td>~100%</td></tr> <tr><td>600-610</td><td>0</td><td>~100%</td></tr> <tr><td>610-620</td><td>0</td><td>~100%</td></tr> <tr><td>620-630</td><td>0</td><td>~100%</td></tr> <tr><td>630-640</td><td>0</td><td>~100%</td></tr> <tr><td>640-650</td><td>0</td><td>~100%</td></tr> <tr><td>650-660</td><td>0</td><td>~100%</td></tr> <tr><td>660-670</td><td>0</td><td>~100%</td></tr> <tr><td>670-680</td><td>0</td><td>~100%</td></tr> <tr><td>680-690</td><td>0</td><td>~100%</td></tr> <tr><td>690-700</td><td>0</td><td>~100%</td></tr> <tr><td>700-710</td><td>0</td><td>~100%</td></tr> <tr><td>710-720</td><td>0</td><td>~100%</td></tr> <tr><td>720-730</td><td>0</td><td>~100%</td></tr> <tr><td>730-740</td><td>0</td><td>~100%</td></tr> <tr><td>740-750</td><td>0</td><td>~100%</td></tr> <tr><td>750-760</td><td>0</td><td>~100%</td></tr> <tr><td>760-770</td><td>0</td><td>~100%</td></tr> <tr><td>770-780</td><td>0</td><td>~100%</td></tr> <tr><td>780-790</td><td>0</td><td>~100%</td></tr> <tr><td>790-800</td><td>0</td><td>~100%</td></tr> <tr><td>800-810</td><td>0</td><td>~100%</td></tr> <tr><td>810-820</td><td>0</td><td>~100%</td></tr> <tr><td>820-830</td><td>0</td><td>~100%</td></tr> <tr><td>830-840</td><td>0</td><td>~100%</td></tr> <tr><td>840-850</td><td>0</td><td>~100%</td></tr> <tr><td>850-860</td><td>0</td><td>~100%</td></tr> <tr><td>860-870</td><td>0</td><td>~100%</td></tr> <tr><td>870-880</td><td>0</td><td>~100%</td></tr> <tr><td>880-890</td><td>0</td><td>~100%</td></tr> <tr><td>890-900</td><td>0</td><td>~100%</td></tr> <tr><td>900-910</td><td>0</td><td>~100%</td></tr> <tr><td>910-920</td><td>0</td><td>~100%</td></tr> <tr><td>920-930</td><td>0</td><td>~100%</td></tr> <tr><td>930-940</td><td>0</td><td>~100%</td></tr> <tr><td>940-950</td><td>0</td><td>~100%</td></tr> <tr><td>950-960</td><td>0</td><td>~100%</td></tr> <tr><td>960-970</td><td>0</td><td>~100%</td></tr> <tr><td>970-980</td><td>0</td><td>~100%</td></tr> <tr><td>980-990</td><td>0</td><td>~100%</td></tr> <tr><td>990-1000</td><td>0</td><td>~100%</td></tr> <tr><td>1000-1010</td><td>0</td><td>~100%</td></tr> <tr><td>1010-1020</td><td>0</td><td>~100%</td></tr> <tr><td>1020-1030</td><td>0</td><td>~100%</td></tr> <tr><td>1030-1040</td><td>0</td><td>~100%</td></tr> <tr><td>1040-1050</td><td>0</td><td>~100%</td></tr> <tr><td>1050-1060</td><td>0</td><td>~100%</td></tr> <tr><td>1060-1070</td><td>0</td><td>~100%</td></tr> <tr><td>1070-1080</td><td>0</td><td>~100%</td></tr> <tr><td>1080-1090</td><td>0</td><td>~100%</td></tr> <tr><td>1090-1100</td><td>0</td><td>~100%</td></tr> <tr><td>1100-1110</td><td>0</td><td>~100%</td></tr> <tr><td>1110-1120</td><td>0</td><td>~100%</td></tr> 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<tr><td>1880-1890</td><td>0</td><td>~100%</td></tr> <tr><td>1890-1900</td><td>0</td><td>~100%</td></tr> <tr><td>1900-1910</td><td>0</td><td>~100%</td></tr> <tr><td>1910-1920</td><td>0</td><td>~100%</td></tr> <tr><td>1920-1930</td><td>0</td><td>~100%</td></tr> <tr><td>1930-1940</td><td>0</td><td>~100%</td></tr> <tr><td>1940-1950</td><td>0</td><td>~100%</td></tr> <tr><td>1950-1960</td><td>0</td><td>~100%</td></tr> <tr><td>1960-1970</td><td>0</td><td>~100%</td></tr> <tr><td>1970-1980</td><td>0</td><td>~100%</td></tr> <tr><td>1980-1990</td><td>0</td><td>~100%</td></tr> <tr><td>1990-2000</td><td>0</td><td>~100%</td></tr> <tr><td>2000-2010</td><td>0</td><td>~100%</td></tr> <tr><td>2010-2020</td><td>0</td><td>~100%</td></tr> <tr><td>2020-2030</td><td>0</td><td>~100%</td></tr> <tr><td>2030-2040</td><td>0</td><td>~100%</td></tr> <tr><td>2040-2050</td><td>0</td><td>~100%</td></tr> <tr><td>2050-2060</td><td>0</td><td>~100%</td></tr> <tr><td>2060-2070</td><td>0</td><td>~100%</td></tr> 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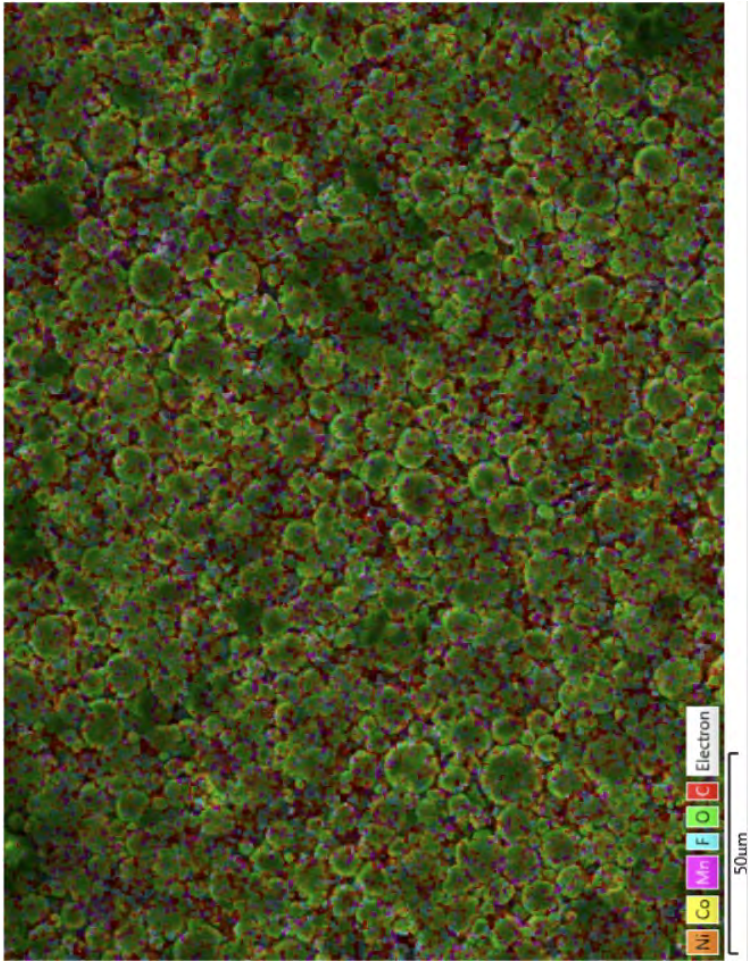
Claim	Contention
HG6 ID#2 Aspect Ratio Histogram MJ1 ID#3 Aspect Ratio Histogram	

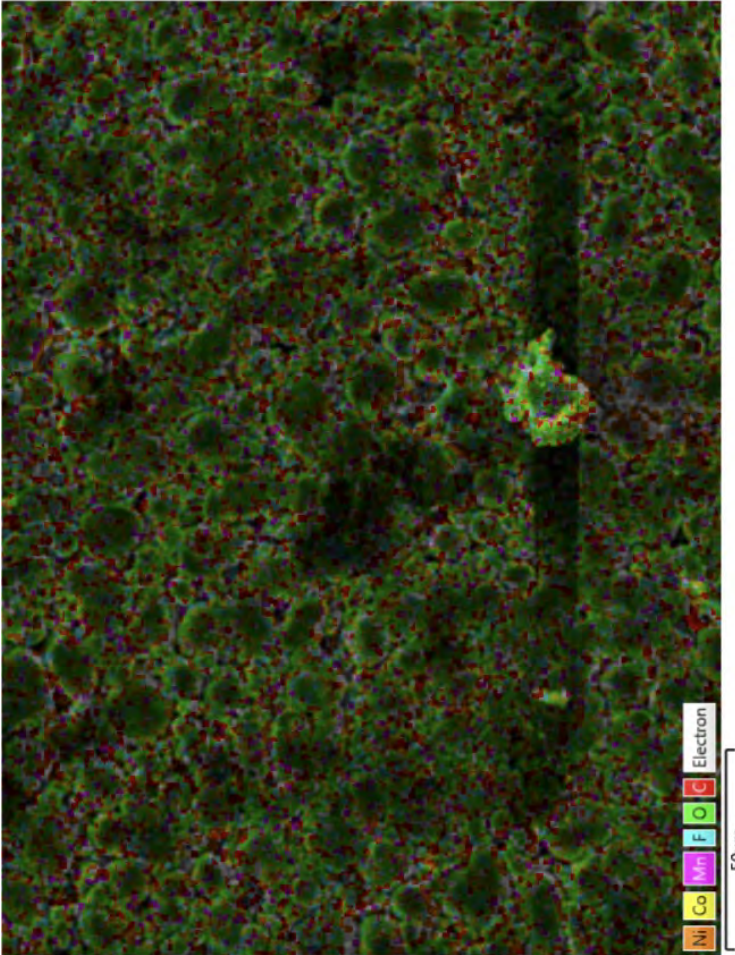
Claim	Contention
	LG Gram Laptop ('22) Frequency Bin (aspect Ratio) Histogram 100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0% 12 10 8 6 4 2 0 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7 3.8 3.9 4.0 4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9 5.0 5.1 5.2 5.3 5.4 5.5 5.6 5.7 5.8 5.9 6.0 6.1 6.2 6.3 6.4 6.5 6.6 6.7 6.8 6.9 7.0 7.1 7.2 7.3 7.4 7.5 7.6 7.7 7.8 7.9 8.0 8.1 8.2 8.3 8.4 8.5 8.6 8.7 8.8 8.9 9.0 9.1 9.2 9.3 9.4 9.5 9.6 9.7 9.8 9.9 10.0 10.1 10.2 10.3 10.4 10.5 10.6 10.7 10.8 10.9 11.0 11.1 11.2 11.3 11.4 11.5 11.6 11.7 11.8 11.9 12.0 12.1 12.2 12.3 12.4 12.5 12.6 12.7 12.8 12.9 13.0 13.1 13.2 13.3 13.4 13.5 13.6 13.7 13.8 13.9 14.0 14.1 14.2 14.3 14.4 14.5 14.6 14.7 14.8 14.9 15.0 15.1 15.2 15.3 15.4 15.5 15.6 15.7 15.8 15.9 16.0 16.1 16.2 16.3 16.4 16.5 16.6 16.7 16.8 16.9 17.0 17.1 17.2 17.3 17.4 17.5 17.6 17.7 17.8 17.9 18.0 18.1 18.2 18.3 18.4 18.5 18.6 18.7 18.8 18.9 19.0 19.1 19.2 19.3 19.4 19.5 19.6 19.7 19.8 19.9 20.0 20.1 20.2 20.3 20.4 20.5 20.6 20.7 20.8 20.9 21.0 21.1 21.2 21.3 21.4 21.5 21.6 21.7 21.8 21.9 22.0 22.1 22.2 22.3 22.4 22.5 22.6 22.7 22.8 22.9 23.0 23.1 23.2 23.3 23.4 23.5 23.6 23.7 23.8 23.9 24.0 24.1 24.2 24.3 24.4 24.5 24.6 24.7 24.8 24.9 25.0 25.1 25.2 25.3 25.4 25.5 25.6 25.7 25.8 25.9 26.0 26.1 26.2 26.3 26.4 26.5 26.6 26.7 26.8 26.9 27.0 27.1 27.2 27.3 27.4 27.5 27.6 27.7 27.8 27.9 28.0 28.1 28.2 28.3 28.4 28.5 28.6 28.7 28.8 28.9 29.0 29.1 29.2 29.3 29.4 29.5 29.6 29.7 29.8 29.9 30.0 30.1 30.2 30.3 30.4 30.5 30.6 30.7 30.8 30.9 31.0 31.1 31.2 31.3 31.4 31.5 31.6 31.7 31.8 31.9 32.0 32.1 32.2 32.3 32.4 32.5 32.6 32.7 32.8 32.9 33.0 33.1 33.2 33.3 33.4 33.5 33.6 33.7 33.8 33.9 34.0 34.1 34.2 34.3 34.4 34.5 34.6 34.7 34.8 34.9 35.0 35.1 35.2 35.3 35.4 35.5 35.6 35.7 35.8 35.9 36.0 36.1 36.2 36.3 36.4 36.5 36.6 36.7 36.8 36.9 37.0 37.1 37.2 37.3 37.4 37.5 37.6 37.7 37.8 37.9 38.0 38.1 38.2 38.3 38.4 38.5 38.6 38.7 38.8 38.9 39.0 39.1 39.2 39.3 39.4 39.5 39.6 39.7 39.8 39.9 40.0 40.1 40.2 40.3 40.4 40.5 40.6 40.7 40.8 40.9 41.0 41.1 41.2 41.3 41.4 41.5 41.6 41.7 41.8 41.9 42.0 42.1 42.2 42.3 42.4 42.5 42.6 42.7 42.8 42.9 43.0 43.1 43.2 43.3 43.4 43.5 43.6 43.7 43.8 43.9 44.0 44.1 44.2 44.3 44.4 44.5 44.6 44.7 44.8 44.9 45.0 45.1 45.2 45.3 45.4 45.5 45.6 45.7 45.8 45.9 46.0 46.1 46.2 46.3 46.4 46.5 46.6 46.7 46.8 46.9 47.0 47.1 47.2 47.3 47.4 47.5 47.6 47.7 47.8 47.9 48.0 48.1 48.2 48.3 48.4 48.5 48.6 48.7 48.8 48.9 49.0 49.1 49.2 49.3 49.4 49.5 49.6 49.7 49.8 49.9 50.0 50.1 50.2 50.3 50.4 50.5 50.6 50.7 50.8 50.9 51.0 51.1 51.2 51.3 51.4 51.5 51.6 51.7 51.8 51.9 52.0 52.1 52.2 52.3 52.4 52.5 52.6 52.7 52.8 52.9 53.0 53.1 53.2 53.3 53.4 53.5 53.6 53.7 53.8 53.9 54.0 54.1 54.2 54.3 54.4 54.5 54.6 54.7 54.8 54.9 55.0 55.1 55.2 55.3 55.4 55.5 55.6 55.7 55.8 55.9 56.0 56.1 56.2 56.3 56.4 56.5 56.6 56.7 56.8 56.9 57.0 57.1 57.2 57.3 57.4 57.5 57.6 57.7 57.8 57.9 58.0 58.1 58.2 58.3 58.4 58.5 58.6 58.7 58.8 58.9 59.0 59.1 59.2 59.3 59.4 59.5 59.6 59.7 59.8 59.9 60.0 60.1 60.2 60.3 60.4 60.5 60.6 60.7 60.8 60.9 61.0 61.1 61.2 61.3 61.4 61.5 61.6 61.7 61.8 61.9 62.0 62.1 62.2 62.3 62.4 62.5 62.6 62.7 62.8 62.9 63.0 63.1 63.2 63.3 63.4 63.5 63.6 63.7 63.8 63.9 64.0 64.1 64.2 64.3 64.4 64.5 64.6 64.7 64.8 64.9 65.0 65.1 65.2 65.3 65.4 65.5 65.6 65.7 65.8 65.9 66.0 66.1 66.2 66.3 66.4 66.5 66.6 66.7 66.8 66.9 67.0 67.1 67.2 67.3 67.4 67.5 67.6 67.7 67.8 67.9 68.0 68.1 68.2 68.3 68.4 68.5 68.6 68.7 68.8 68.9 69.0 69.1 69.2 69.3 69.4 69.5 69.6 69.7 69.8 69.9 70.0 70.1 70.2 70.3 70.4 70.5 70.6 70.7 70.8 70.9 71.0 71.1 71.2 71.3 71.4 71.5 71.6 71.7 71.8 71.9 72.0 72.1 72.2 72.3 72.4 72.5 72.6 72.7 72.8 72.9 73.0 73.1 73.2 73.3 73.4 73.5 73.6 73.7 73.8 73.9 74.0 74.1 74.2 74.3 74.4 74.5 74.6 74.7 74.8 74.9 75.0 75.1 75.2 75.3 75.4 75.5 75.6 75.7 75.8 75.9 76.0 76.1 76.2 76.3 76.4 76.5 76.6 76.7 76.8 76.9 77.0 77.1 77.2 77.3 77.4 77.5 77.6 77.7 77.8 77.9 78.0 78.1 78.2 78.3 78.4 78.5 78.6 78.7 78.8 78.9 79.0 79.1 79.2 79.3 79.4 79.5 79.6 79.7 79.8 79.9 80.0 80.1 80.2 80.3 80.4

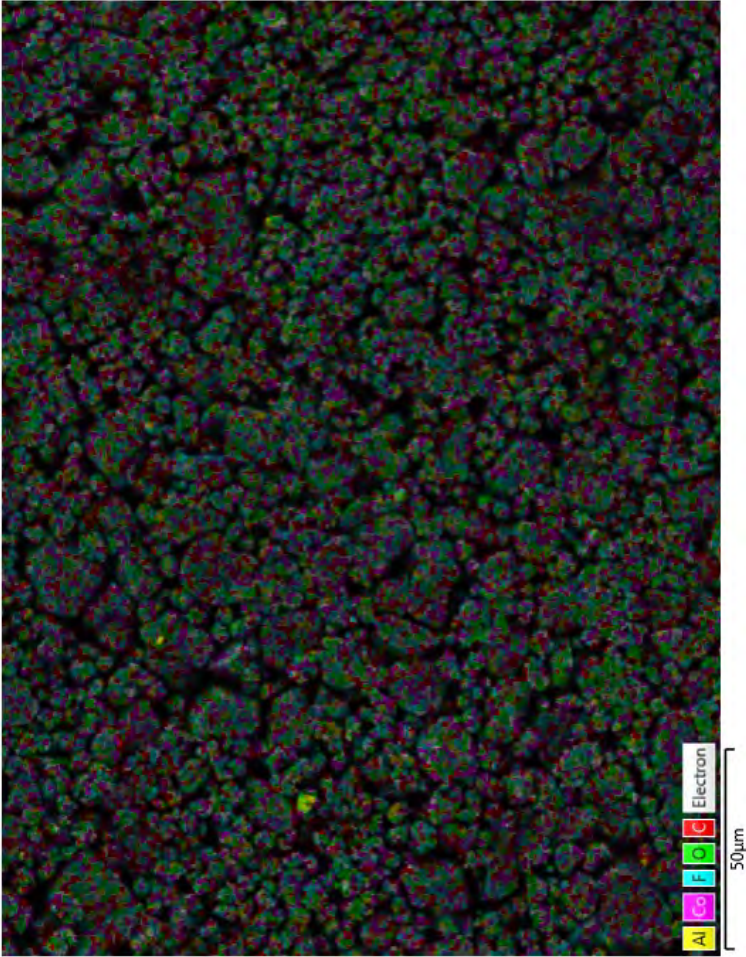
Claim	Contention
	LG Gram Laptop ('19):  LG G8 Cellphone Battery ('19): 
and oxidation levels from 1% to 15% by weight of the carbon nanotube.	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes "wherein the discrete carbon nanotubes have ... oxidation levels from 1% to 15% by weight of the carbon nanotube." Specifically, each of the '483 Accused Products comprises carbon nanotubes having oxidation levels not exceeding 15% by weight of the carbon nanotube, with the majority having oxidation levels of approximately 1% to 3% by weight of the carbon nanotube.

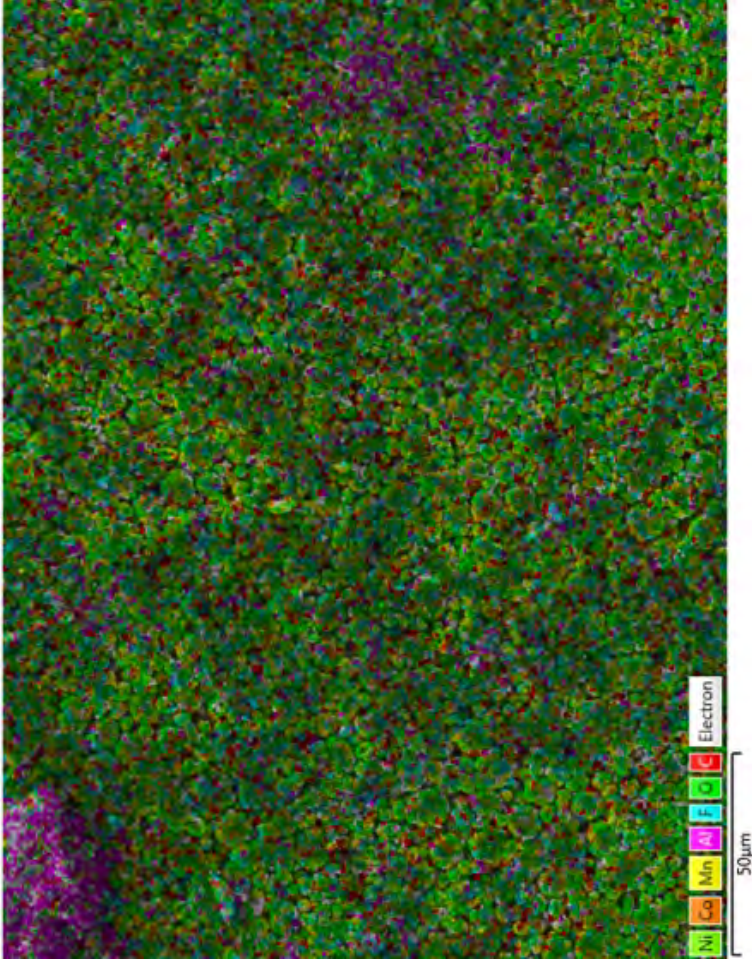
Claim		Contention
		This is demonstrated in part by the below images relating to certain representative '483 Accused Products, which reflects the presence of oxygen in each sample. HG2  The image is an EDS spectrum showing peaks for Mn, Co, Ni, F, O, C, and Electron. A scale bar indicates 50um.

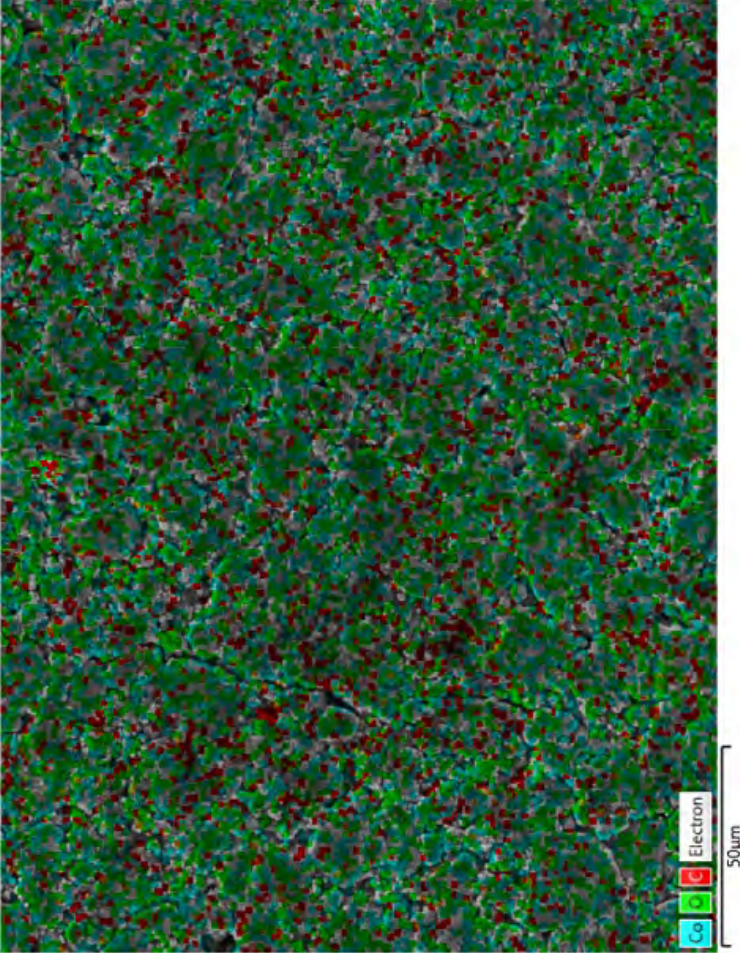
HG6



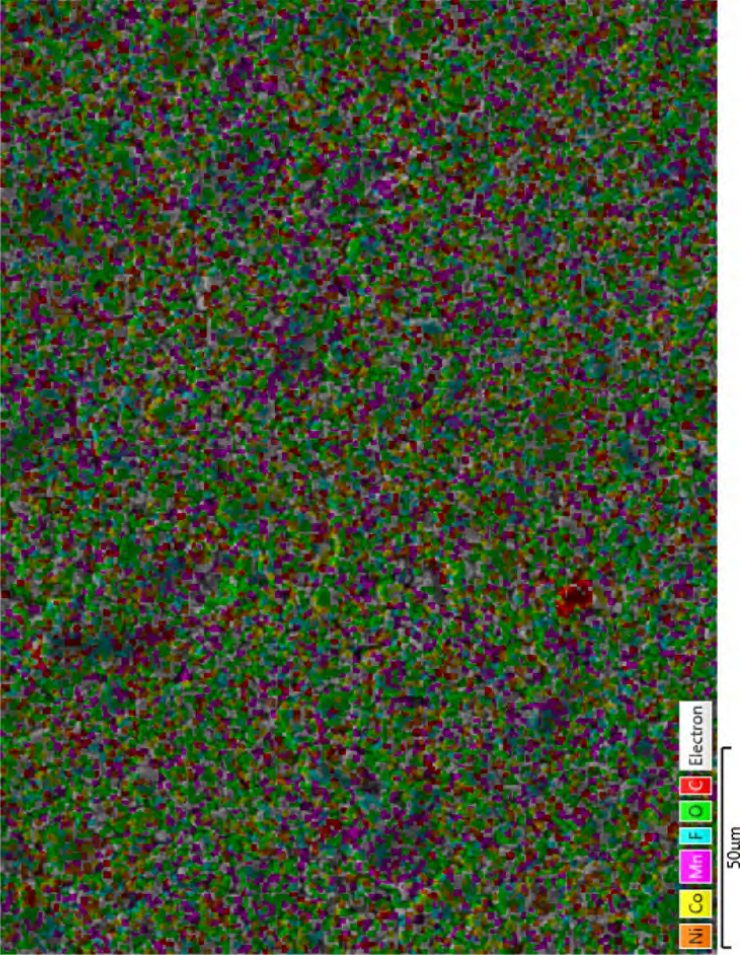
Claim		Contention
		MJ1 

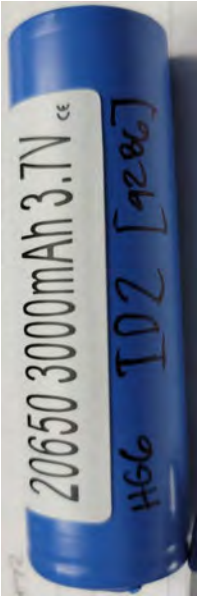
Claim		Contention
		LG Gram Laptop ('22): EDS Layered Image 1  50µm

Claim		Contention
		LG E78 eVehicle/ESS Pouch: EDS Layered Image 2 

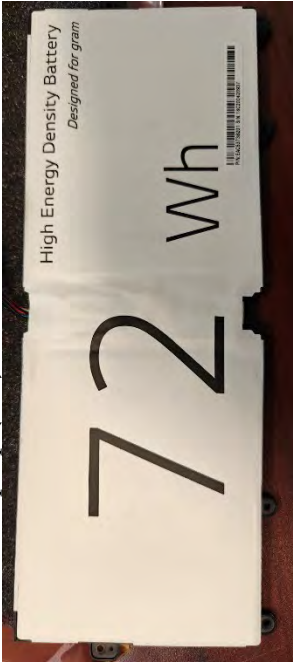
Claim		Contention
		LG Gram Laptop ('19): EDS Layered Image 3  The image is an EDS Layered Image 3, a type of scanning electron micrograph (SEM) used for material analysis. It displays a dense, granular surface texture. The image is color-coded to represent different elements: Carbon (C) is shown in red, Oxygen (O) in green, and Silicon (Si) in blue. A scale bar in the bottom right corner indicates a length of 50µm. The legend at the bottom right identifies the elements: C (red), O (green), Si (blue), and Electron (white).

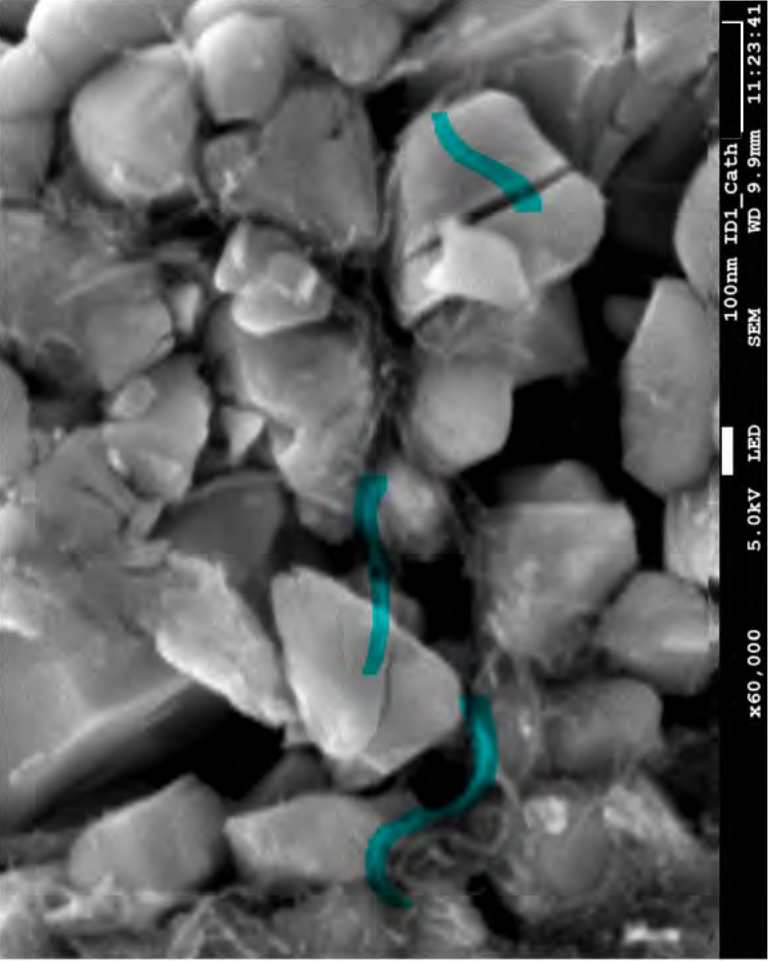
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
Infringement of U.S. Patent No. 10,153,483

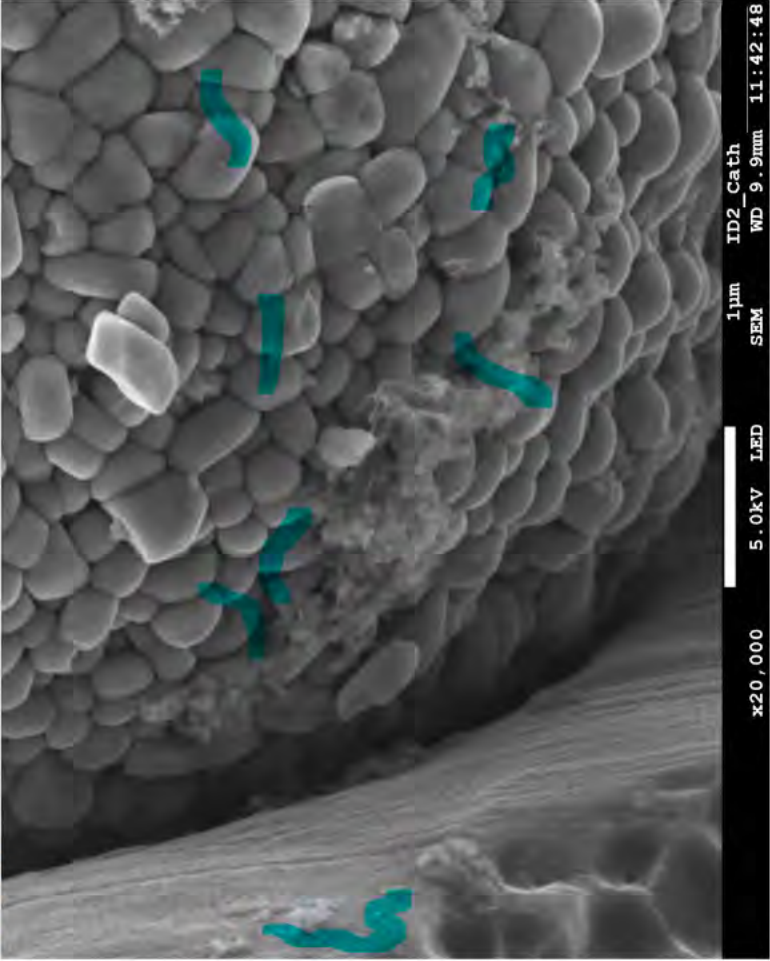
Claim	Contention
	LG G8 Cellphone Battery ('19): EDS Layered Image 1 
9 A composition useful for lithium-ion batteries comprising:	To the extent that the preamble is limiting, it is met by the '483 Accused Products, each of which comprises "[a] composition useful for lithium-ion batteries." Specifically, each of the '483 Accused Products is a battery that comprises lithium-ion cells and/or pouches. For example, LG has stated that "the two most widely used mixtures are NCM (<u>Li</u>, O, Ni, Co, Mn) and NCA (<u>Li</u>, Ni, Co, Al, O)." https://blog.lgchem.com/en/2023/05/31_cathode_material/. Further, LG also utilizes a mixture comprised of LCO (<u>Li</u>, Co, O) and LFP (<u>Li</u>, Iron, Phosphate). Examples of such batteries are depicted below. LG HG2:

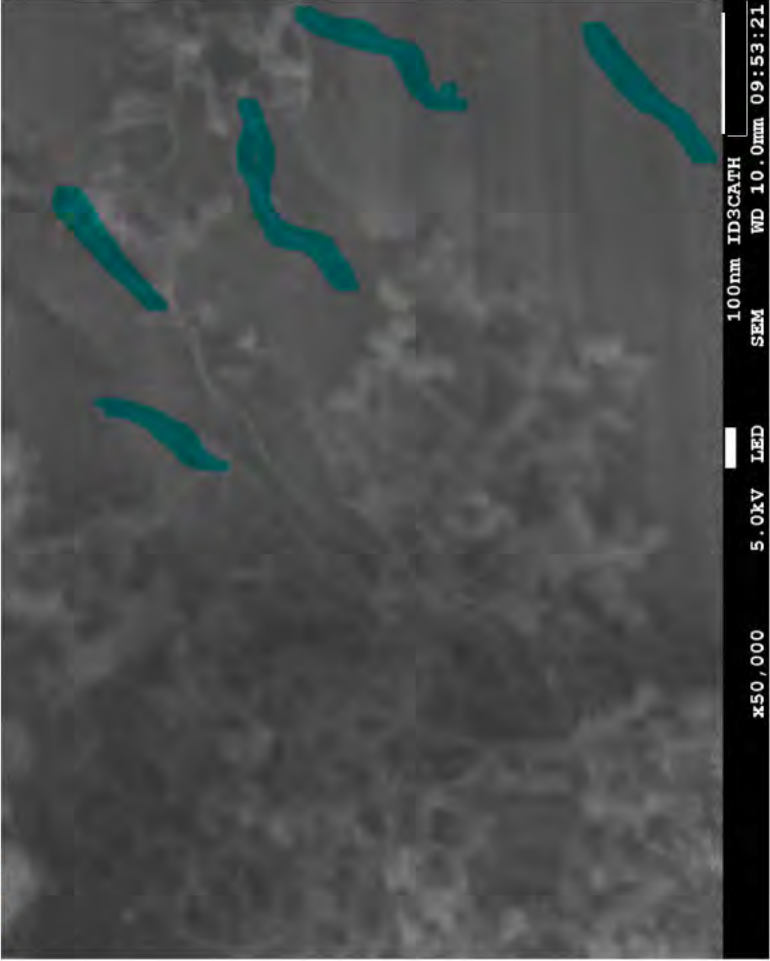
Claim	Contention
	 LG HG6:  LG MJ1:  LG Gram Laptop ('22): 

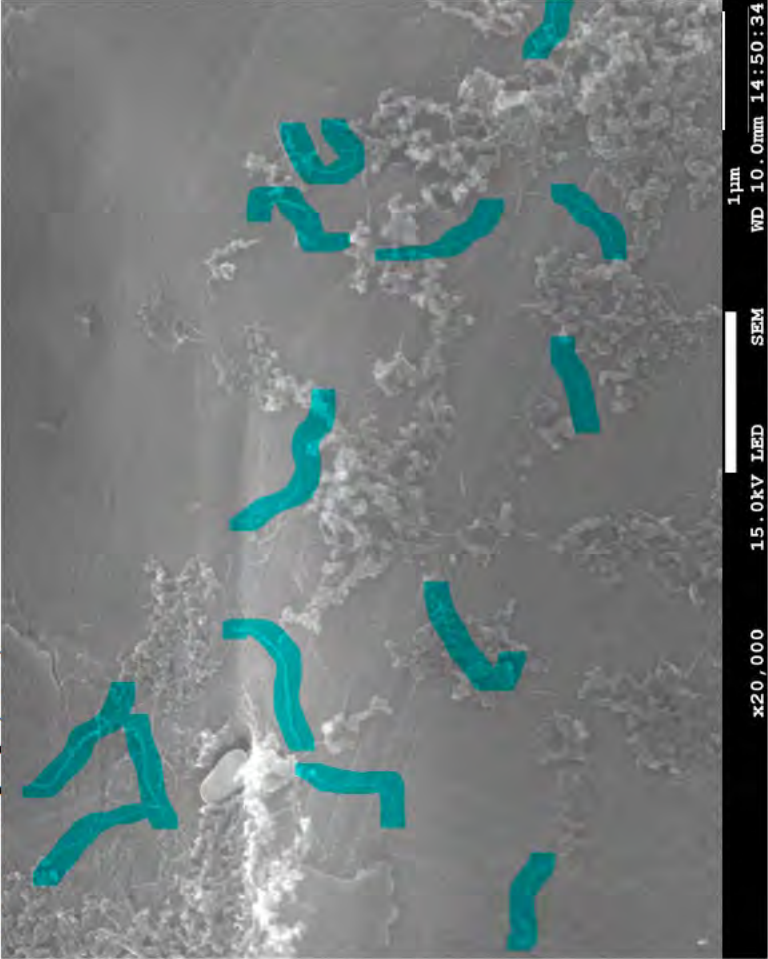
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

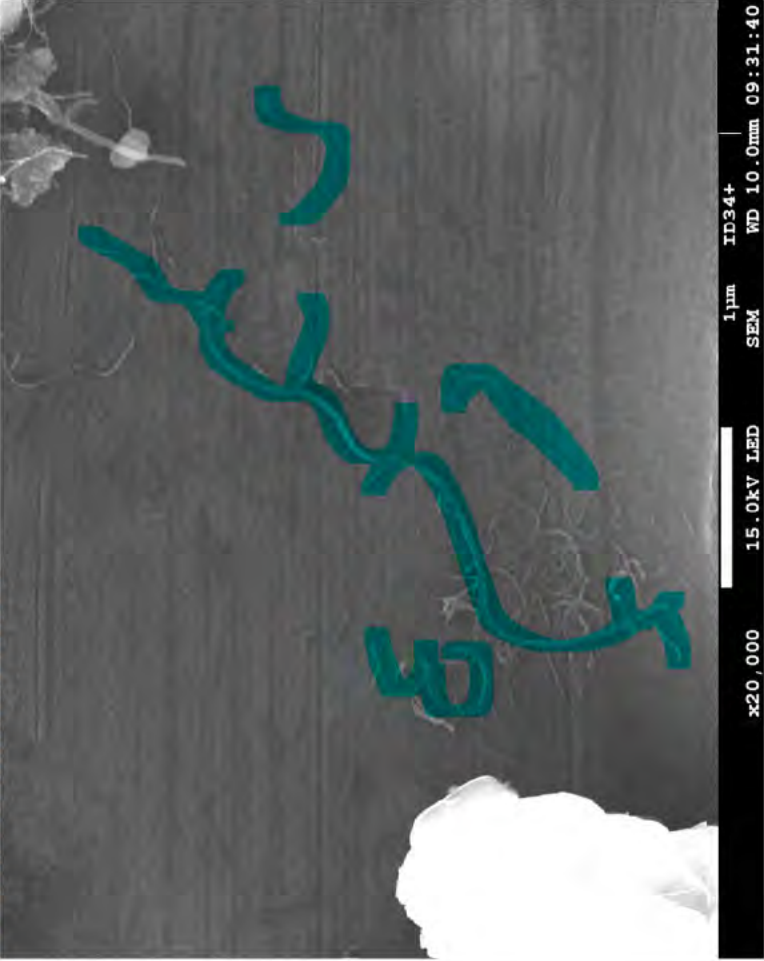
Claim	Contention
	LG E78 eVehicle/ESS Pouch:  LG Gram Laptop ('19):  LG G8 Cellphone Battery ('19): 
uniformly dispersible oxidized non-agglomerated carbon nanotubes having a surface,	This element is met by the '483 Accused Products, each of which comprises "uniformly dispersible oxidized non-agglomerated carbon nanotubes having a surface." Specifically, as demonstrated at least by portions of the below images highlighted in blue relating to certain representative '483 Accused Products, each of the '483 Accused Products comprises uniformly dispersible oxidized non-agglomerated carbon nanotubes having a surface.

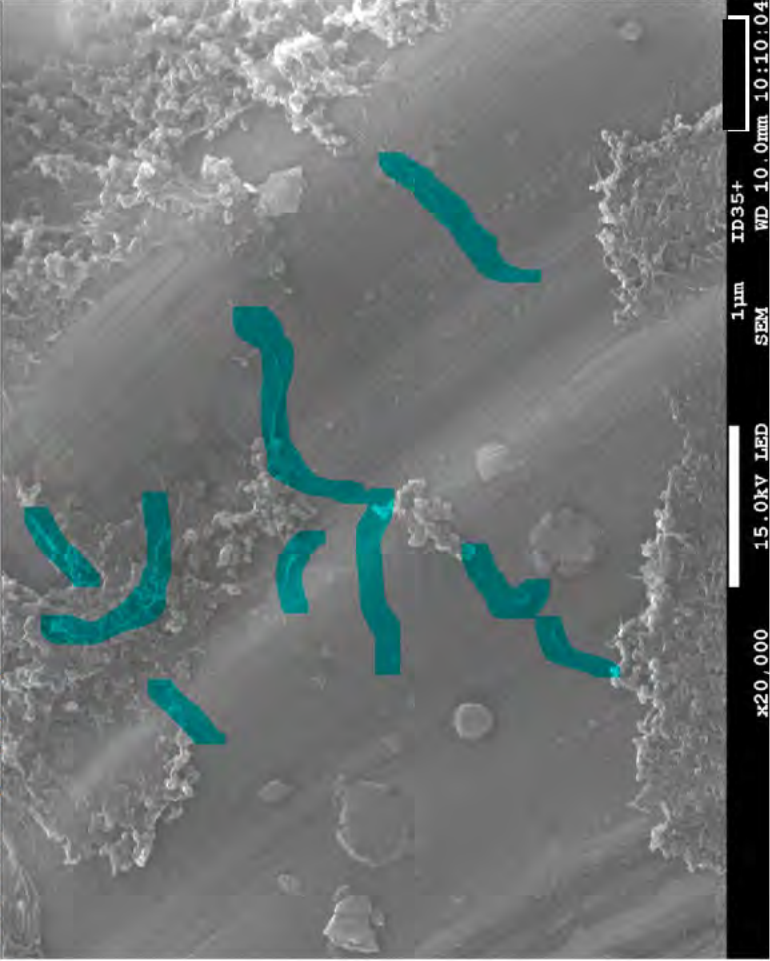
Claim	Contention
LG HG2:	

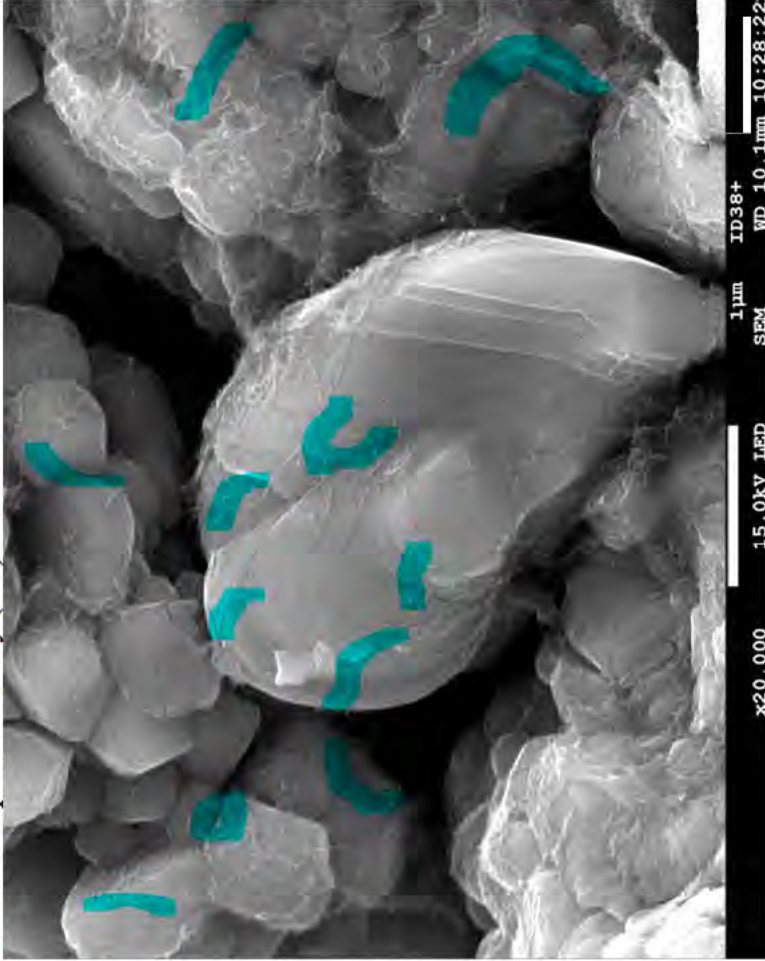
Claim		Contention
		LG HG6: 

Claim		Contention
		LG MJ1: 

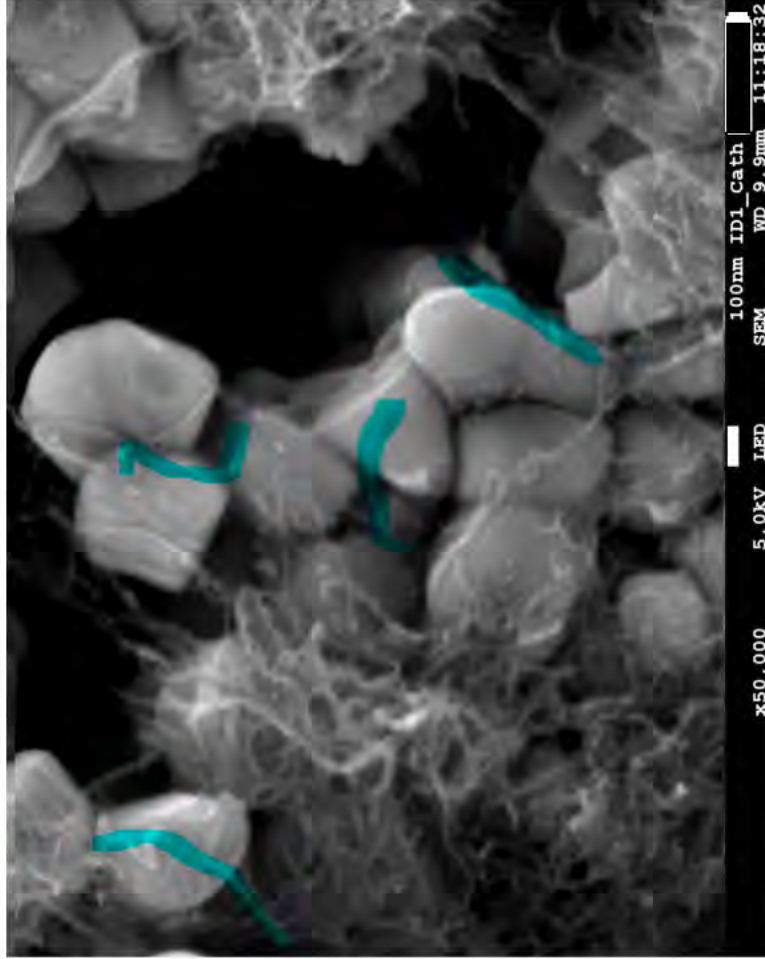
Claim		Contention
		LG Gram Laptop (2022) 

Claim	Contention
	LG E78 eVehicle/ESS Pouch: 

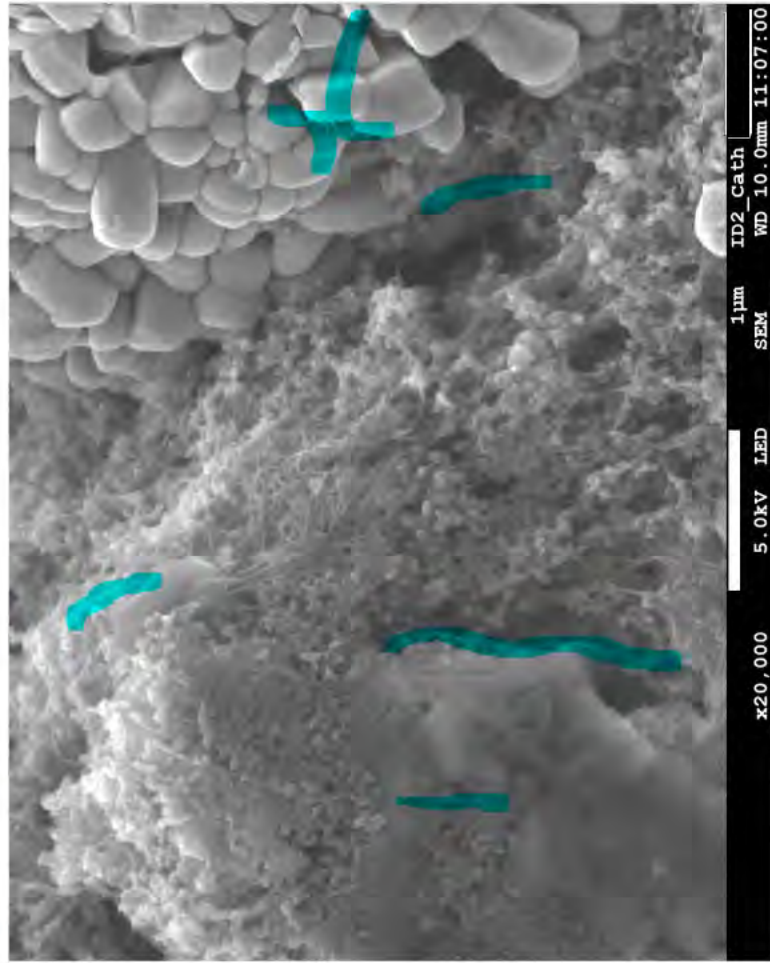
Claim	Contention
	LG Gram Laptop ('19): 

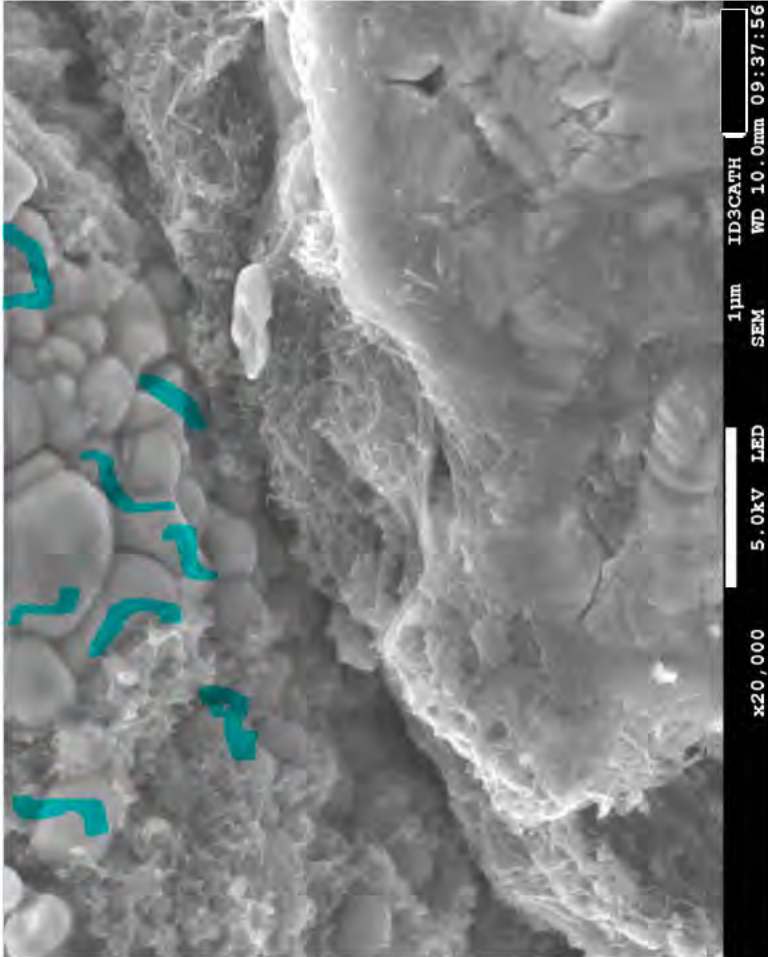
Claim	Contention
	LG G8 Cellphone Battery ('19): 
and mixtures of ion active materials comprising migratable ions[,] said materials comprising crystals or layers of lithium ion active material	This element is met by the '483 Accused Products, each of which comprises "mixtures of ion active materials comprising migratable ions[,] said materials comprising crystals or layers of lithium ion active material." Specifically, each of the '483 Accused Products comprises mixtures of ion active materials comprising migratable ions, such as those comprising the electrolyte (e.g., Li⁺ / PF₆⁻). Further, said materials comprise crystals of lithium-ion active material, including crystals comprised of NCM, NCA, LCO, and/or LFP.

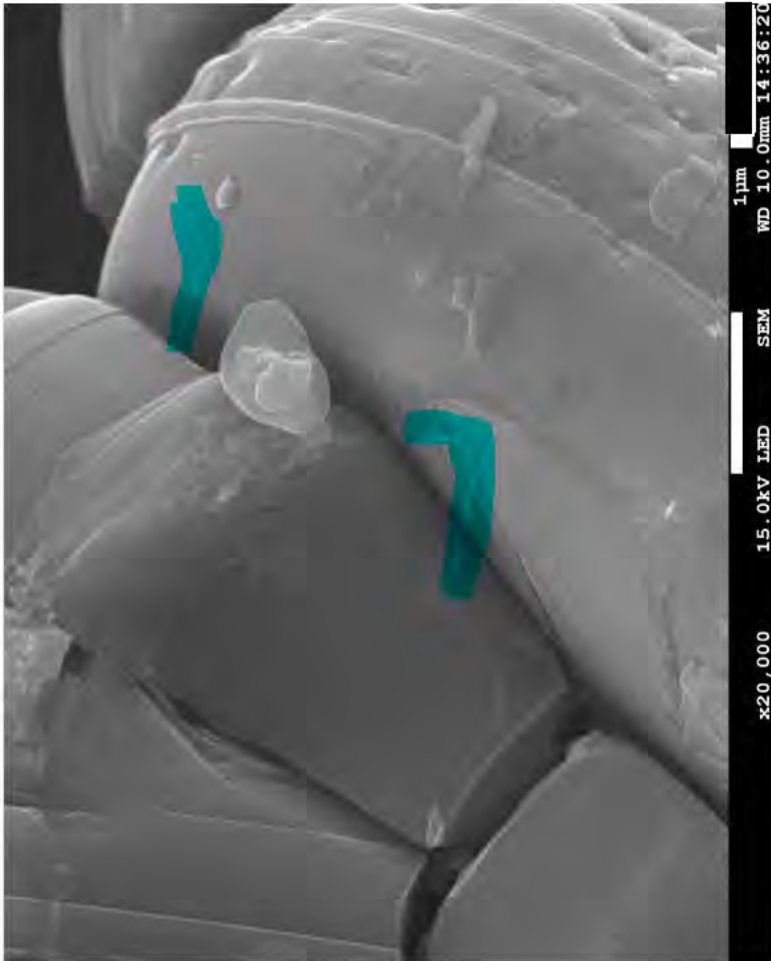
This is demonstrated by the below images relating to certain representative '483 Accused Products, which reflects that HG2 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 400-500 nm (nanoscale) in diameter.

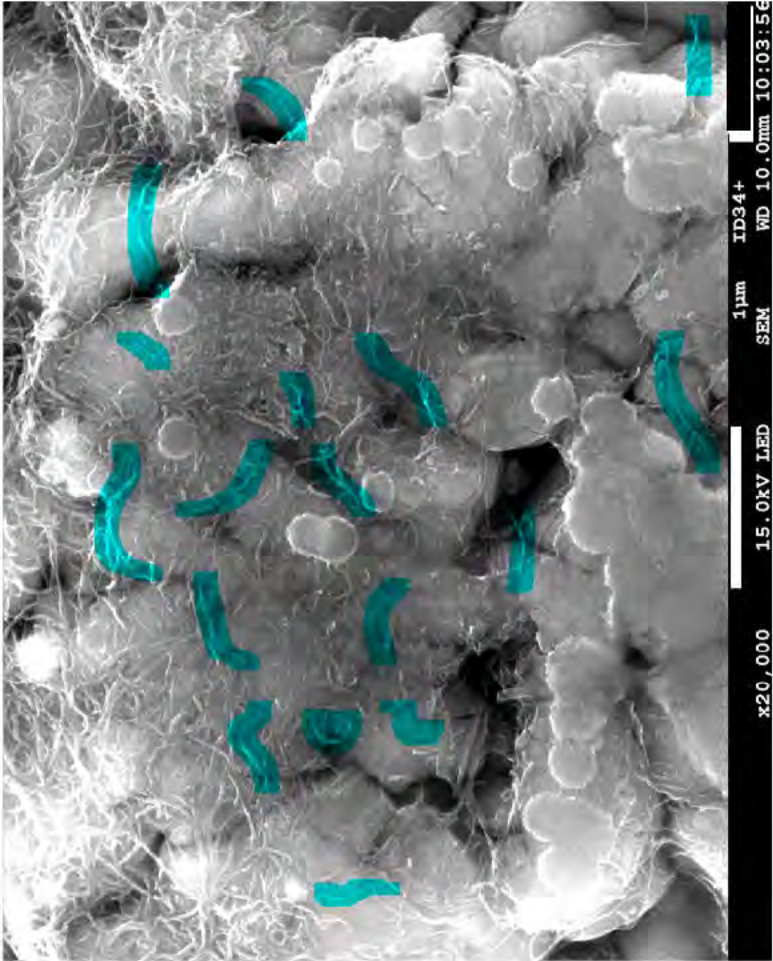


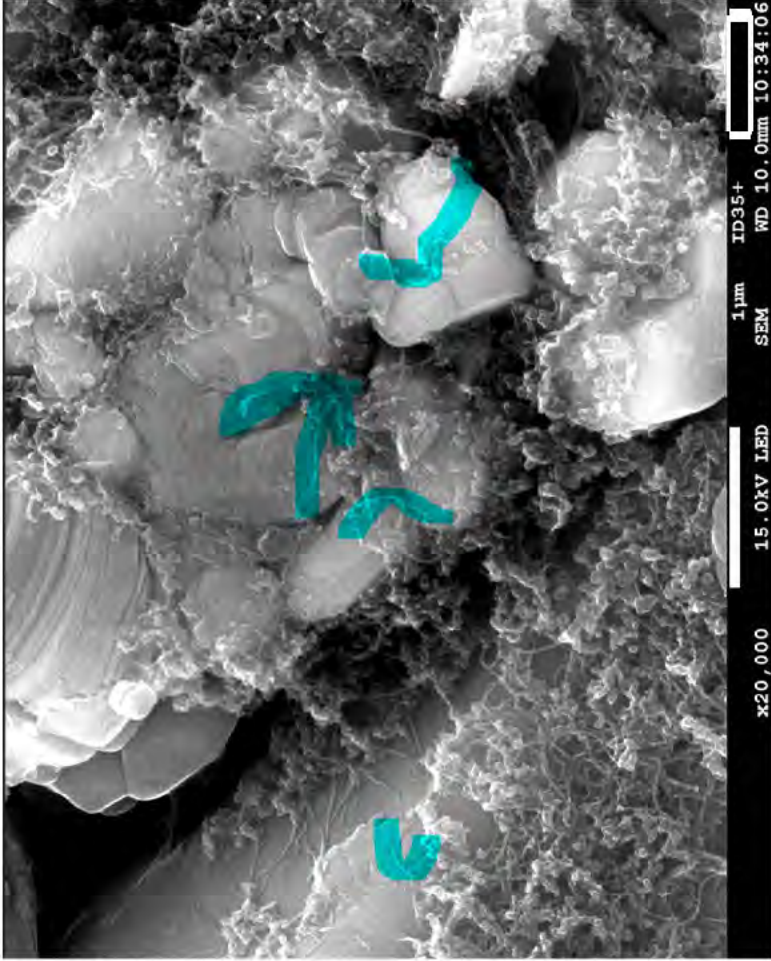
As another example, as depicted below, HG6 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200–400 nm (nanoscale) in diameter.



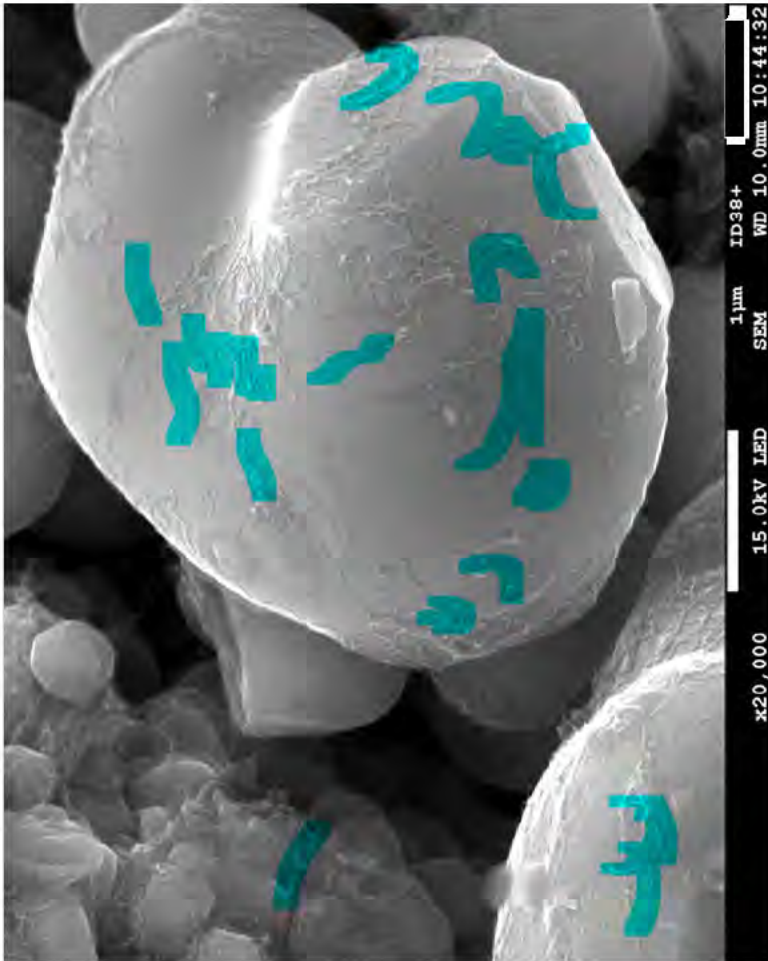
Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter.  The image is a grayscale Scanning Electron Micrograph (SEM) showing a surface with various features. Two specific areas are highlighted with blue rectangular boxes. The first box is located in the upper left quadrant and highlights a small, rounded, and somewhat irregularly shaped feature. The second box is located in the lower right quadrant and highlights a more elongated, curved, and segmented feature. The background of the image shows a complex, textured surface with various ridges, valleys, and smaller features. At the bottom of the image, there is a black bar with white text providing technical details: 'x20,000' on the left, '15.0kV LED' in the center, 'SEM' on the right, and 'WD 10.0mm 14:36:20' on the far right. A small white scale bar labeled '1µm' is positioned above the 'SEM' text.

Claim	Contention
	As another example, as depicted below, E78 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

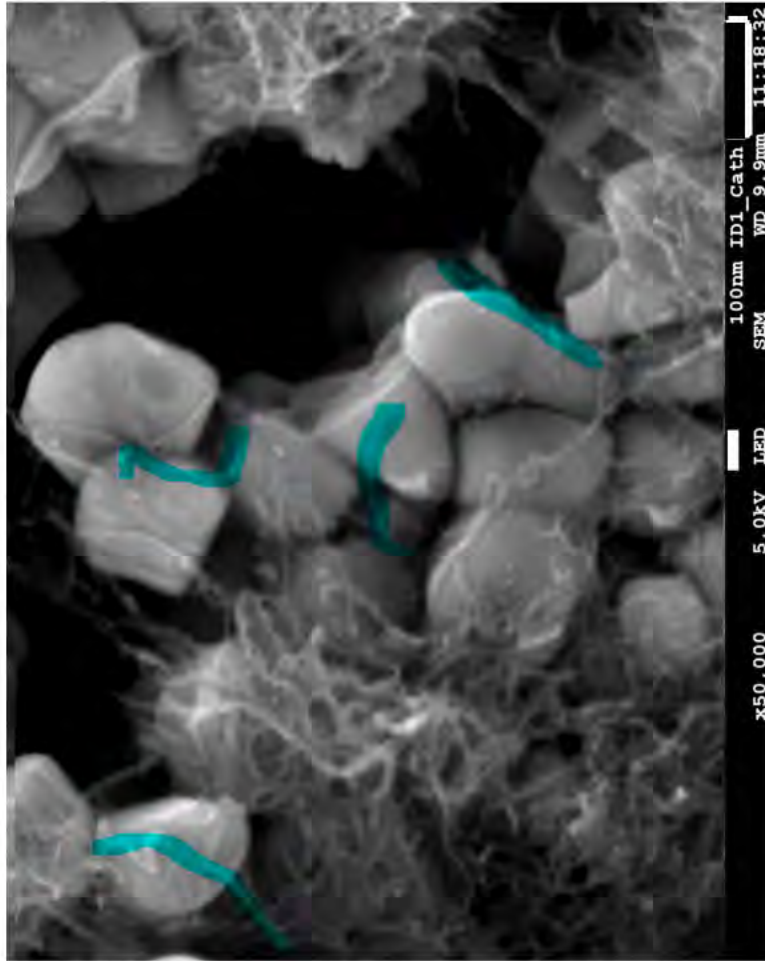
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
Infringement of U.S. Patent No. 10,153,483

Claim	Contention
	As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals. 
wherein a ratio of lithium ion to other total ions in the ion active materials is at least 2:1,	This element is met by the '483 Accused Products, each of which comprises mixtures of ion active materials "wherein a ratio of lithium ion to other total ions in the ion active materials is at least 2:1 to 25:1." For example, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Further, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable

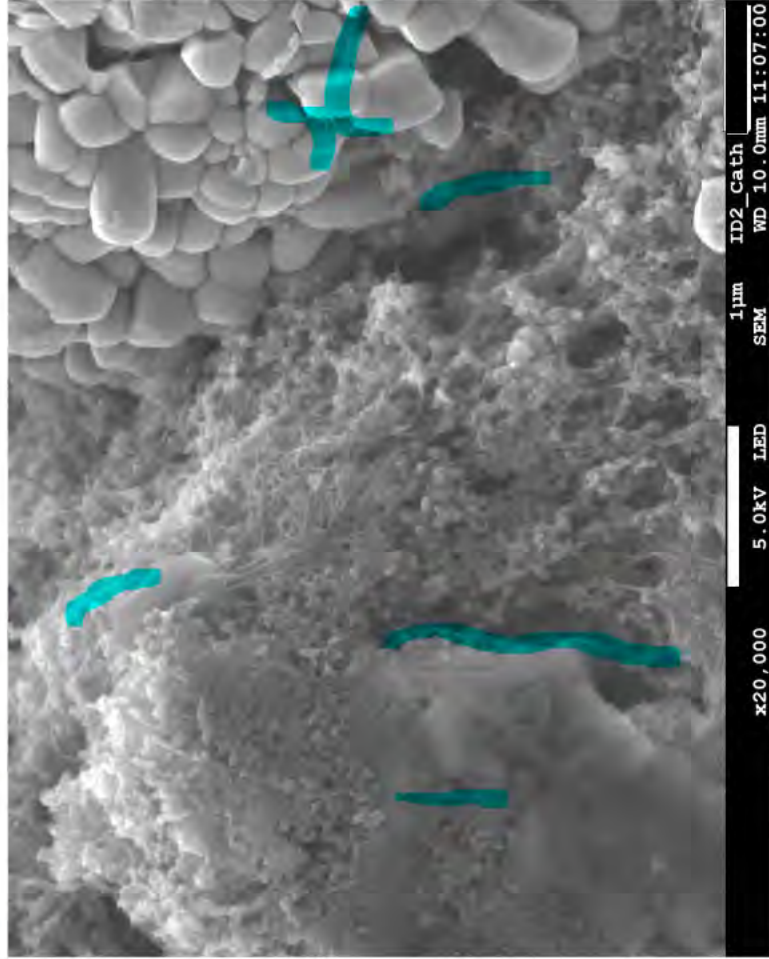
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)
 Infringement of U.S. Patent No. 10,153,483

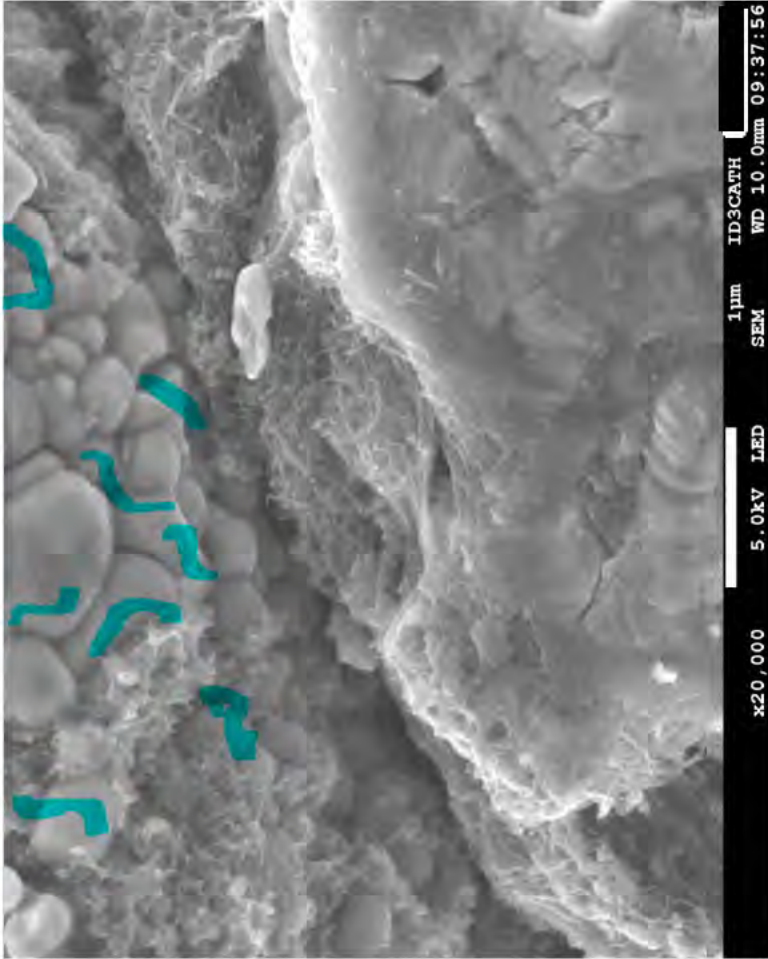
Claim		Contention
		nature of the Li ⁺ , its concentration within the cathode varies during charge and discharge processes but is configured to be within a 2:1 to 25:1 ratio at least when at approximately a 44% to 98% state of charge.
	wherein the discrete carbon nanotubes have crystals or layers of lithium ion active materials ionically attached to their surface,	This element is met by the '483 Accused Products, each of which comprises "discrete carbon nanotubes have crystals or layers of lithium ion active material ionically attached to their surface." Specifically, each of the '483 Accused Products comprises discrete carbon nanotubes have crystals of lithium ion active material ionically attached to their surface.

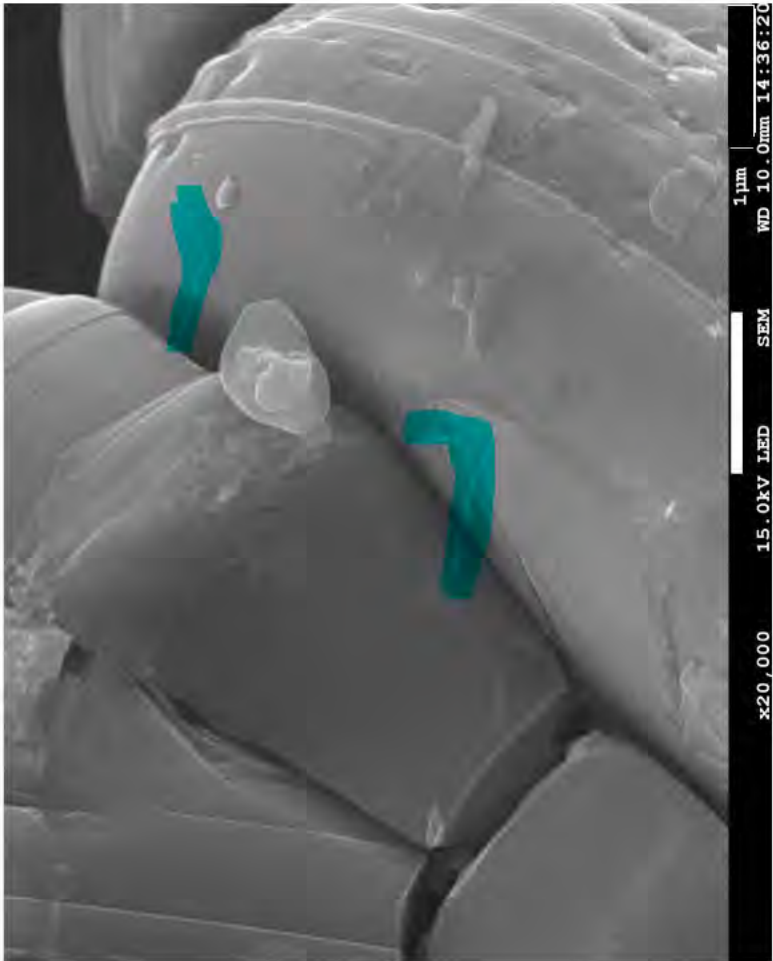
This is demonstrated by the below images relating to certain representative '483 Accused Products, which reflects that HG2 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 400-500 nm (nanoscale) in diameter.

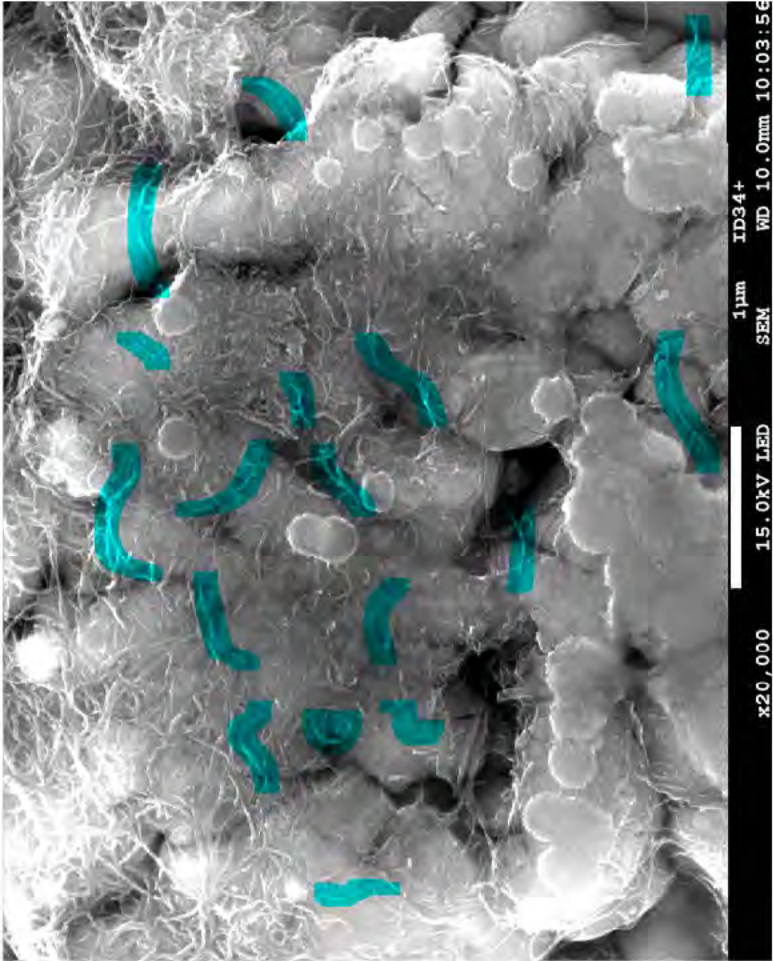


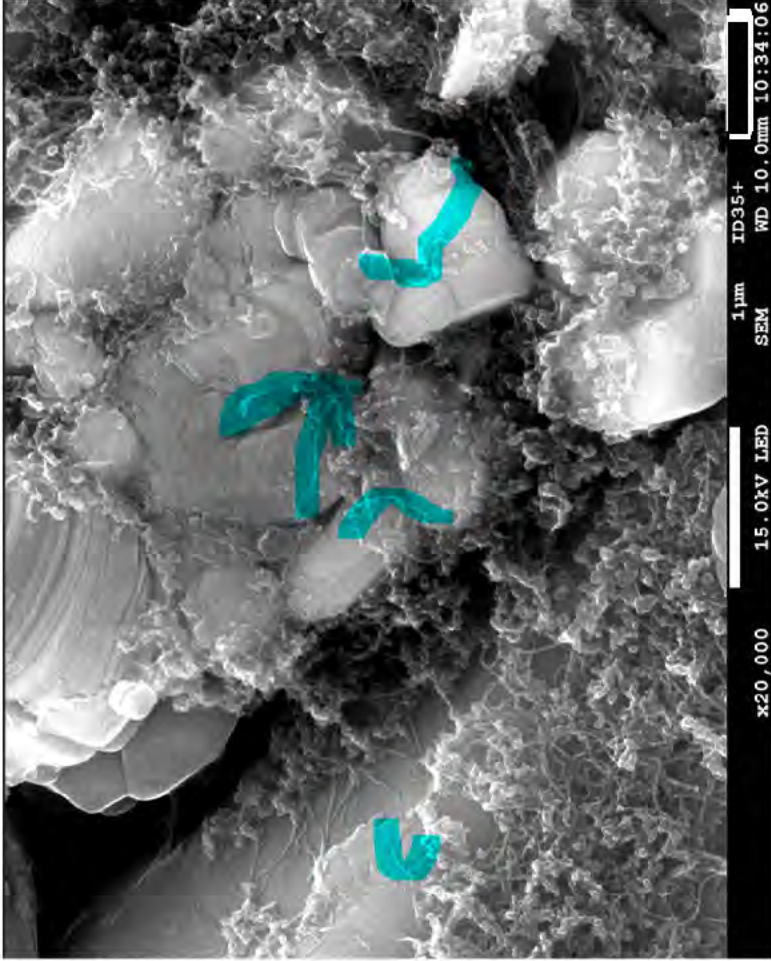
As another example, as depicted below, HG6 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200–400 nm (nanoscale) in diameter.



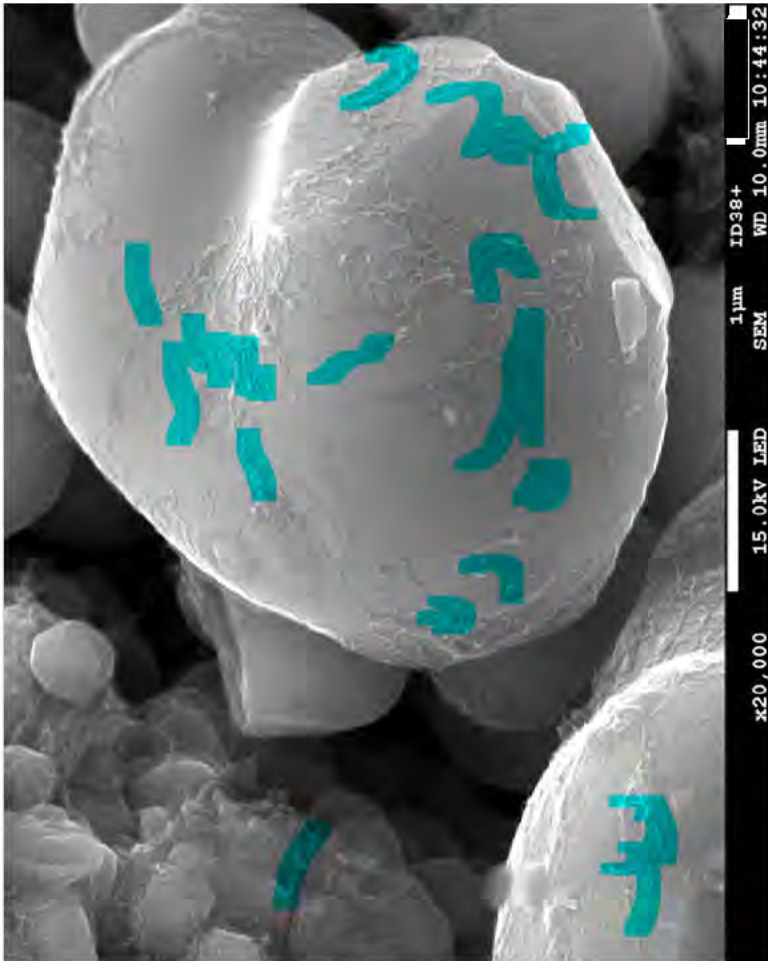
Claim	Contention
	As another example, as depicted below, MJ1 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

Claim	Contention
	As another example, as depicted below, the LG Gram Battery ('22) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter.  The SEM image shows a surface with several large, irregular, light-colored crystals. Two small, dark, cylindrical structures are highlighted with blue rectangular boxes. A scale bar in the bottom right corner indicates 1 μm. Technical data at the bottom right reads: x20,000 15.0kV LED SEM WD 10.0mm 14:36:20.

Claim	Contention
	As another example, as depicted below, E78 comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals that are approximately 200-500 nm (nanoscale) in diameter. 

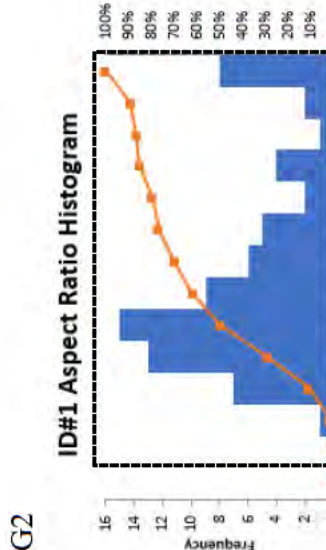
Claim	Contention
	As another example, as depicted below, the LG Gram Laptop ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to lithium cobalt oxide (LCO) active material crystals that are approximately 1,000-20,000 nm (nanoscale) in diameter. 

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Claim	Contention
	As another example, as depicted below, LG G8 Cellphone Battery ('19) comprises discrete nanotubes (highlighted in blue) attached via their surface to nickel cobalt manganese (NCM) active material crystals. 
and wherein the discrete carbon nanotubes comprise oxidized species selected from the group consisting of	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes "wherein the discrete carbon nanotubes comprise oxidized species selected from the group consisting of carboxylic, ketone, or hydroxyl functionalities." Specifically, each of the '483 Accused Products include discrete carbon nanotubes that comprise carboxylic, ketone, and/or hydroxyl functionalities.

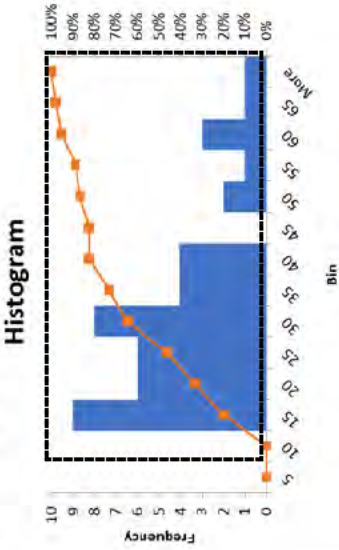
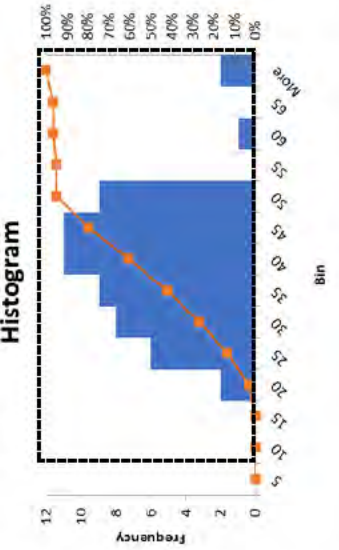
Molecular Rebar Design, LLC et al. v. LG Energy Solution, Ltd., No. 2:24-cv-107 (E.D. Tex.)

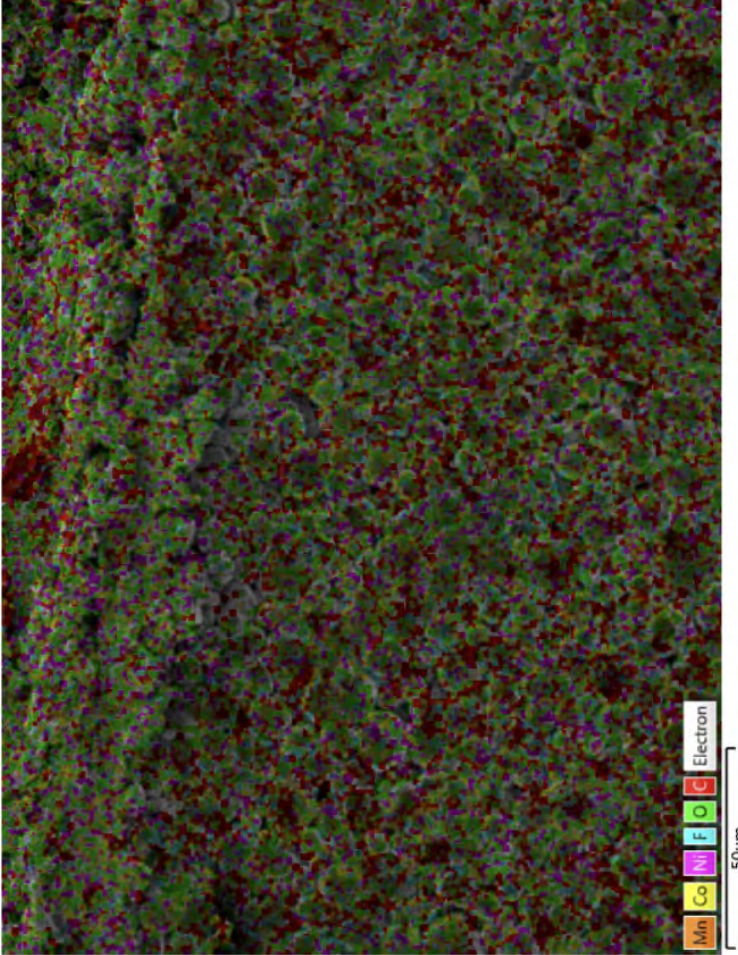
Infringement of U.S. Patent No. 10,153,483

Claim	Contention																																																						
carboxylic, ketone, or hydroxyl functionalities,																																																							
and wherein the discrete carbon nanotubes have an aspect ratio of 10 to 500	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes “wherein the discrete carbon nanotubes have an aspect ratio of 10 to 500.” Specifically, each of the '483 Accused Products comprises carbon nanotubes having an aspect ratio of between 10 to 500 when its length is divided by its diameter. This is demonstrated by the below images relating to certain representative '483 Accused Products, which reflects that the '483 Accused Products comprise discrete nanotubes with an aspect ratio typically between 10 and 100: HG2  The histogram, titled 'ID#1 Aspect Ratio Histogram', displays the frequency of aspect ratios for a specific sample. The x-axis is labeled 'Bin (Aspect Ratio)' and ranges from 0 to 16. The y-axis is labeled 'Frequency' and ranges from 0 to 16. The histogram bars are blue. An orange line with circular markers represents a cumulative distribution curve, starting at (0,0) and ending at (16,100%). <table><caption>Approximate data from ID#1 Aspect Ratio Histogram</caption><thead><tr><th>Bin (Aspect Ratio)</th><th>Frequency</th><th>Cumulative %</th></tr></thead><tbody><tr><td>0</td><td>0</td><td>0%</td></tr><tr><td>1</td><td>1</td><td>~6%</td></tr><tr><td>2</td><td>1</td><td>~12%</td></tr><tr><td>3</td><td>1</td><td>~19%</td></tr><tr><td>4</td><td>1</td><td>~26%</td></tr><tr><td>5</td><td>1</td><td>~33%</td></tr><tr><td>6</td><td>1</td><td>~40%</td></tr><tr><td>7</td><td>1</td><td>~47%</td></tr><tr><td>8</td><td>1</td><td>~54%</td></tr><tr><td>9</td><td>1</td><td>~61%</td></tr><tr><td>10</td><td>1</td><td>~68%</td></tr><tr><td>11</td><td>1</td><td>~75%</td></tr><tr><td>12</td><td>1</td><td>~82%</td></tr><tr><td>13</td><td>1</td><td>~89%</td></tr><tr><td>14</td><td>1</td><td>~96%</td></tr><tr><td>15</td><td>1</td><td>~100%</td></tr><tr><td>16</td><td>1</td><td>~100%</td></tr></tbody></table>	Bin (Aspect Ratio)	Frequency	Cumulative %	0	0	0%	1	1	~6%	2	1	~12%	3	1	~19%	4	1	~26%	5	1	~33%	6	1	~40%	7	1	~47%	8	1	~54%	9	1	~61%	10	1	~68%	11	1	~75%	12	1	~82%	13	1	~89%	14	1	~96%	15	1	~100%	16	1	~100%
Bin (Aspect Ratio)	Frequency	Cumulative %																																																					
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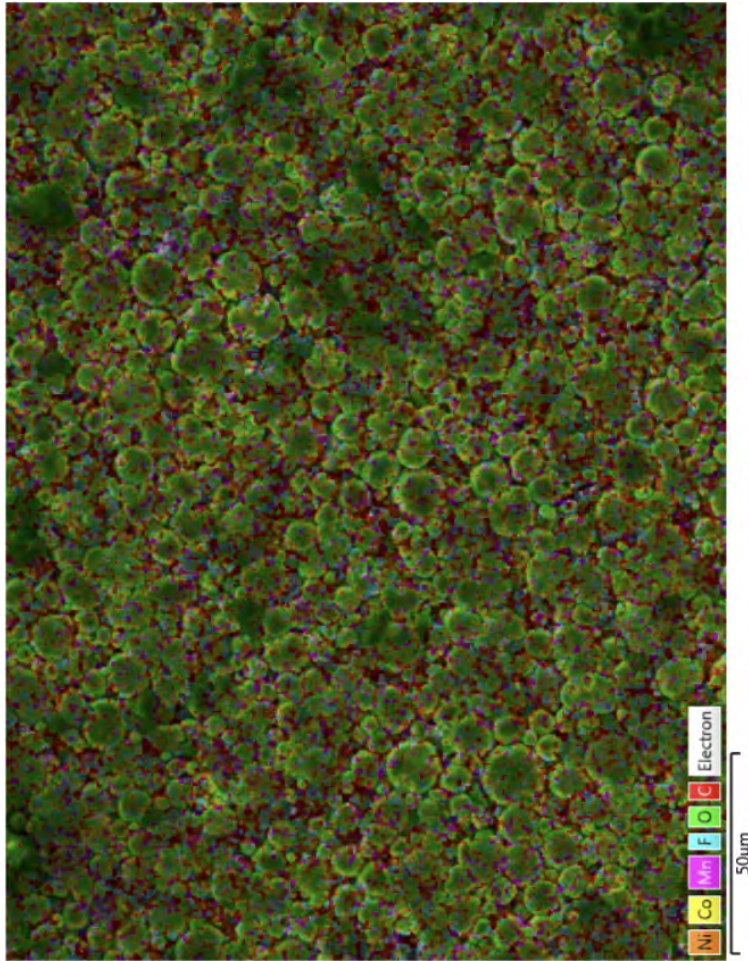
Claim	Contention
HG6 ID#2 Aspect Ratio Histogram This histogram shows the frequency distribution of aspect ratios for ID#2. The x-axis is labeled 'Bin (Aspect Ratio)' and ranges from 1 to 16. The y-axis is labeled 'Frequency' and ranges from 0 to 14. The bars are blue, and an orange line with markers is overlaid, showing a peak frequency of approximately 13 at bin 10. A dashed box encloses the histogram area. MJ1 ID#3 Aspect Ratio Histogram This histogram shows the frequency distribution of aspect ratios for ID#3. The x-axis is labeled 'Bin (Aspect Ratio)' and ranges from 1 to 16. The y-axis is labeled 'Frequency' and ranges from 0 to 16. The bars are blue, and an orange line with markers is overlaid, showing a peak frequency of approximately 15 at bin 10. A dashed box encloses the histogram area.	Contention

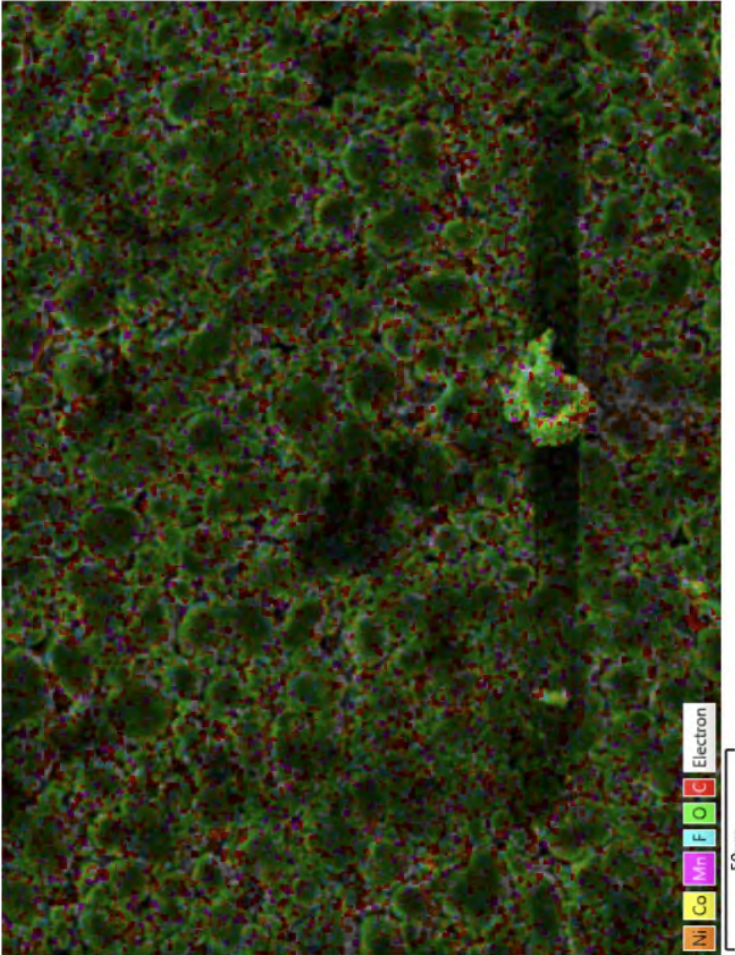
Claim	Contention
	LG Gram Laptop ('22) Histogram Frequency Bin (aspect Ratio) More 100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0% 12 10 8 6 4 2 0 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 LG E78 eVehicle/ESS Pouch: Histogram Frequency Bin More 100% 90% 80% 70% 60% 50% 40% 30% 20% 10% 0% 12 10 8 6 4 2 0 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

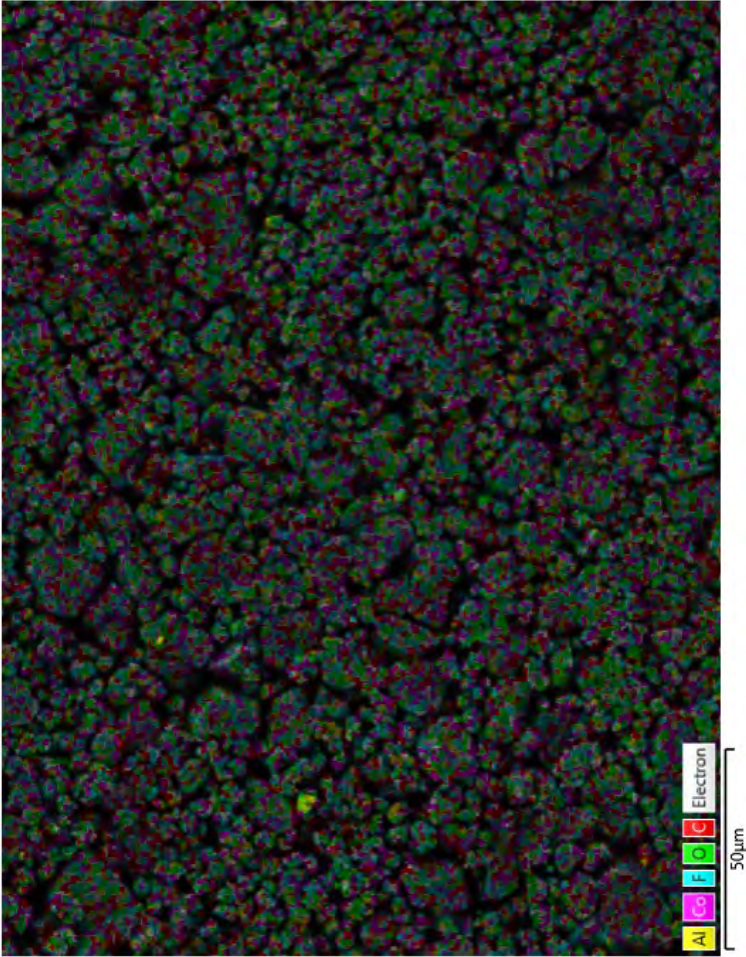
Claim	Contention
	LG Gram Laptop ('19):  LG G8 Cellphone Battery ('19): 
and oxidation levels from 1% to 15% by weight of the carbon nanotube.	This element is met by the '483 Accused Products, each of which comprises discrete carbon nanotubes "wherein the discrete carbon nanotubes have ... oxidation levels from 1% to 15% by weight of the carbon nanotube." Specifically, each of the '483 Accused Products comprises carbon nanotubes having oxidation levels not exceeding 15% by weight of the carbon nanotube, with the majority having oxidation levels of approximately 1% to 3% by weight of the carbon nanotube.

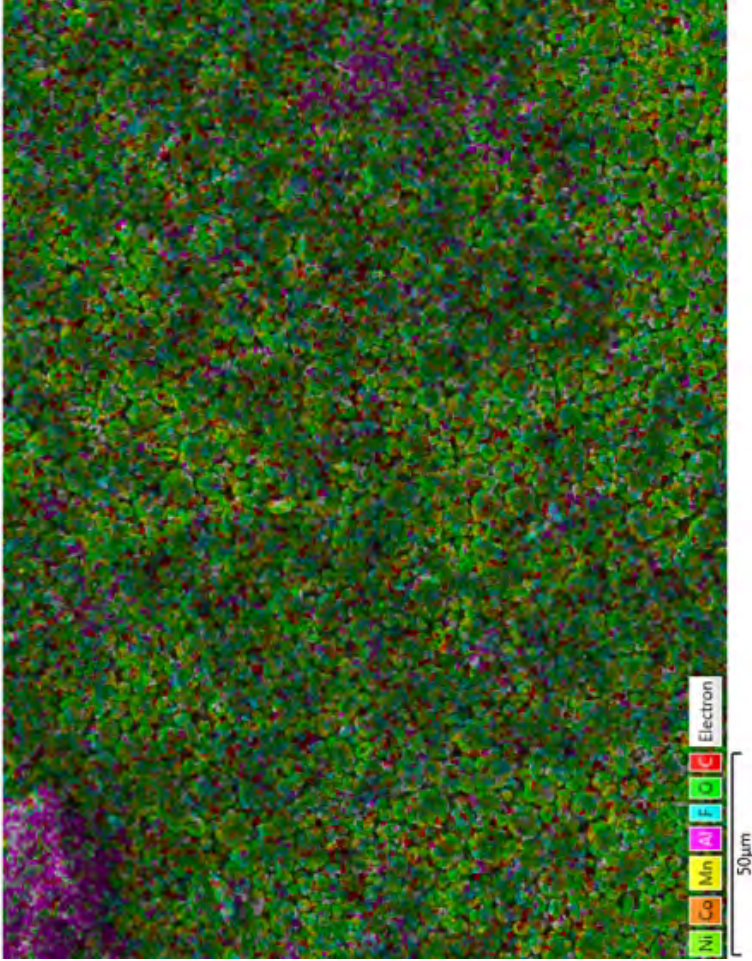
Claim		Contention
		This is demonstrated in part by the below images relating to certain representative '483 Accused Products, which reflects the presence of oxygen in each sample. HG2  The image is an EDS spectrum showing a dense distribution of elemental peaks. A scale bar at the bottom right indicates 50um. The legend at the bottom right identifies the elements: Mn (orange), Co (yellow), Ni (purple), F (light blue), O (green), C (red), and Electron (white). The spectrum shows a high concentration of Oxygen (O) and Carbon (C) peaks, with smaller peaks for Manganese (Mn), Cobalt (Co), and Nickel (Ni).

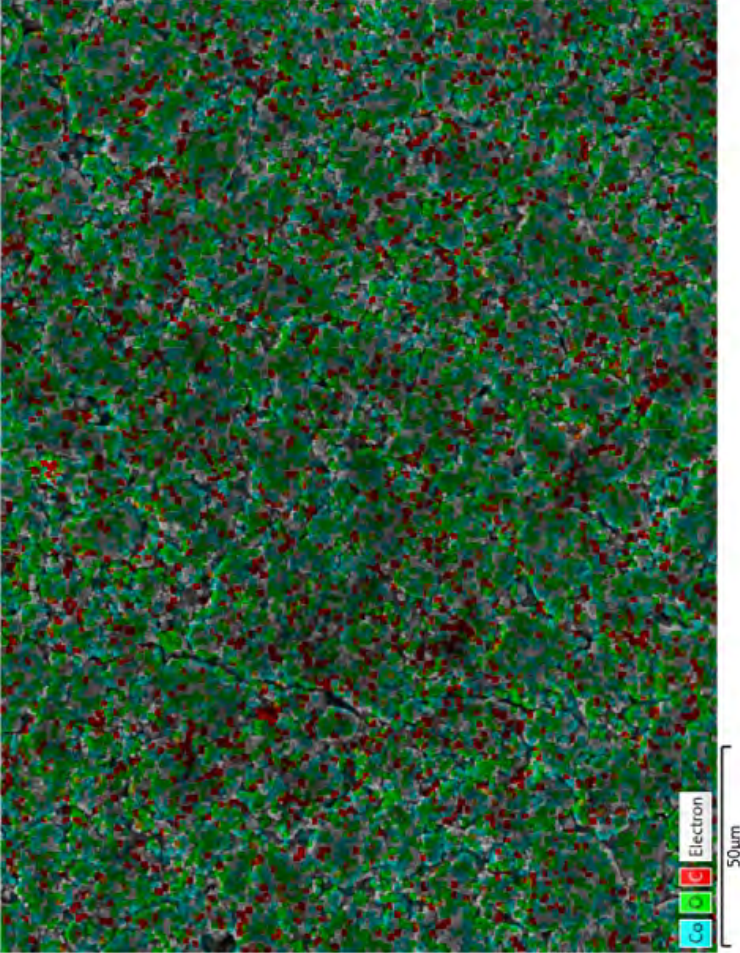
HG6



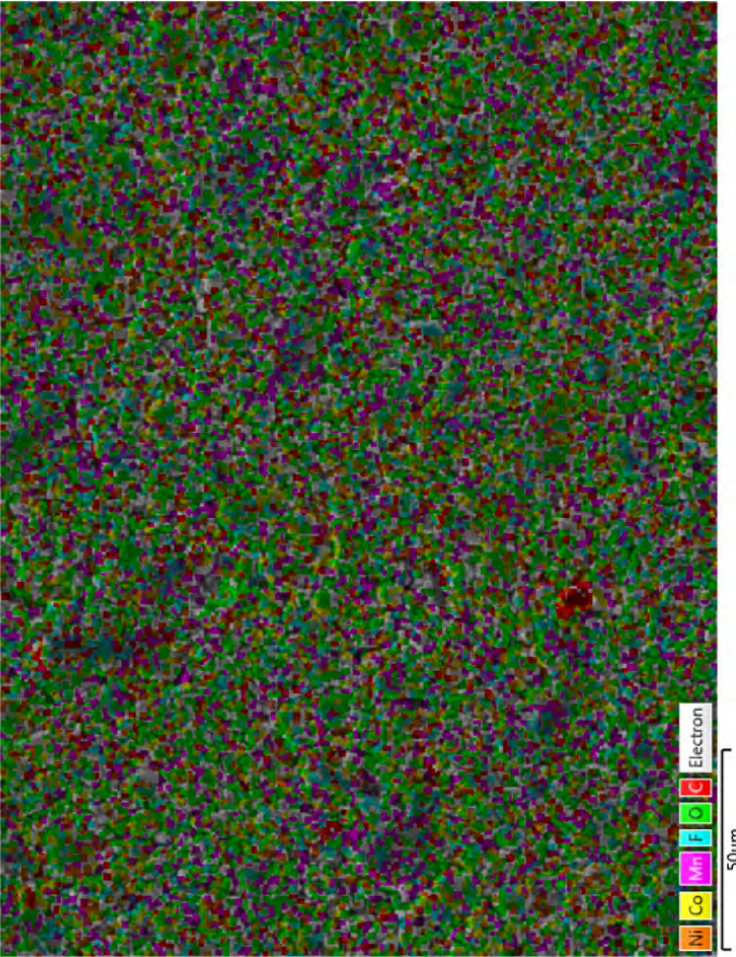
Claim		Contention
		MJ1 

Claim		Contention
		LG Gram Laptop ('22): EDS Layered Image 1  50µm

Claim		Contention
		LG E78 eVehicle/ESS Pouch: EDS Layered Image 2 

Claim		Contention
		LG Gram Laptop ('19): EDS Layered Image 3  The image is an EDS Layered Image 3, which is a composite of elemental maps. It shows a dense, granular surface with a mix of colors representing different elements: blue for Carbon (C), green for Oxygen (O), red for Silicon (Si), and grey for other elements. A scale bar in the bottom right corner indicates a length of 50µm. The legend at the bottom right shows the color coding: C (blue), O (green), Si (red), and Electron (grey).

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Claim		Contention
		LG G8 Cellphone Battery ('19): EDS Layered Image 1 
10	The composition of claim 9, wherein the crystals or layers of lithium ion active materials are chemically attached to the surface of the dispersible oxidized carbon nanotubes.	This element is met by the '483 Accused Products, each of which comprises "[t]he composition of claim 9, wherein the crystals or layers of lithium ion active materials are chemically attached to the surface of the dispersible oxidized carbon nanotubes." Specifically, as detailed above, each of the '483 Accused Products comprises "[t]he composition of claim 9." Further, each of the '483 Accused Products comprises a composition wherein the crystals of lithium ion active materials are chemically attached covalently, ionically, or by Van der Waals attractions to the surface of the dispersible oxidized carbon nanotubes.

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Claim	Contention
11 The composition of claim 1 where the ratio of lithium ion to other total ions in the ion active materials is from 3:1 to 25:1.	This element is met by the '483 Accused Products, each of which comprises "[t]he composition of claim 1 where the ratio of lithium ion to other total ions in the ion active materials is from 3:1 to 25:1." Specifically, as detailed above, each of the '483 Accused Products comprises "[t]he composition of claim 1." Further, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Additionally, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable nature of the Li⁺, its concentration within the cathode varies during charge and discharge processes but is configured to be within a 3:1 to 25:1 ratio at least when at approximately a 44% to 95% state of charge.
12 The composition of claim 1 where the ratio of lithium ion to other total ions in the ion active materials is from 10:1 to 25:1.	This element is met by the '483 Accused Products, each of which comprises "[t]he composition of claim 1 where the ratio of lithium ion to other total ions in the ion active materials is from 10:1 to 25:1." Specifically, as detailed above, each of the '483 Accused Products comprises "[t]he composition of claim 1." Further, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Additionally, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable nature of the Li⁺, its concentration within the cathode varies during charge and discharge processes but is configured to be within a 10:1 to 25:1 ratio at least when at approximately a 44% to 79% state of charge.
13 The composition of claim 7 where the ratio of lithium ion to other total ions in the ion active materials is from 3:1 to 25:1.	This element is met by the '483 Accused Products, each of which comprises "[t]he composition of claim 7 where the ratio of lithium ion to other total ions in the ion active materials is from 3:1 to 25:1." Specifically, as detailed above, each of the '483 Accused Products comprises "[t]he composition of claim 7." Further, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Additionally, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable nature of the Li⁺, its concentration within the cathode varies during charge and discharge processes but is configured to be within a 3:1 to 25:1 ratio at least when at approximately a 44% to 95% state of charge.

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Claim		Contention
14	The composition of claim 7 where the ratio of lithium ion to other total ions in the ion active materials is from 10:1 to 25:1.	This element is met by the '483 Accused Products, each of which comprises "[t]he composition of claim 7 where the ratio of lithium ion to other total ions in the ion active materials is from 10:1 to 25:1." Specifically, as detailed above, each of the '483 Accused Products comprises "[t]he composition of claim 7." Further, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Additionally, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable nature of the Li⁺, its concentration within the cathode varies during charge and discharge processes but is configured to be within a 10:1 to 25:1 ratio at least when at approximately a 44% to 79% state of charge.
15	The composition of claim 8 where the ratio of lithium ion to other total ions in the ion active materials is from 3:1 to 25:1.	This element is met by the '483 Accused Products, each of which comprises "[t]he composition of claim 8 where the ratio of lithium ion to other total ions in the ion active materials is from 3:1 to 25:1." Specifically, as detailed above, each of the '483 Accused Products comprises "[t]he composition of claim 8." Further, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Additionally, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable nature of the Li⁺, its concentration within the cathode varies during charge and discharge processes but is configured to be within a 3:1 to 25:1 ratio at least when at approximately a 44% to 95% state of charge.
16	The composition of claim 8 where the ratio of lithium ion to other total ions in the ion active materials is from 10:1 to 25:1.	This element is met by the '483 Accused Products, each of which comprises "[t]he composition of claim 8 where the ratio of lithium ion to other total ions in the ion active materials is from 10:1 to 25:1." Specifically, as detailed above, each of the '483 Accused Products comprises "[t]he composition of claim 8." Further, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Additionally, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable nature of the Li⁺, its concentration within the cathode varies during charge and

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Claim		Contention
		discharge processes but is configured to be within a 10:1 to 25:1 ratio at least when at approximately a 44% to 79% state of charge.
17	The composition of claim 9 where the ratio of lithium ion to other total ions in the ion active materials is from 3:1 to 25:1.	This element is met by the '483 Accused Products, each of which comprises "[t]he composition of claim 9 where the ratio of lithium ion to other total ions in the ion active materials is from 3:1 to 25:1." Specifically, as detailed above, each of the '483 Accused Products comprises "[t]he composition of claim 9." Further, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Additionally, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable nature of the Li⁺, its concentration within the cathode varies during charge and discharge processes but is configured to be within a 3:1 to 25:1 ratio at least when at approximately a 44% to 95% state of charge.
18	The composition of claim 9 where the ratio of lithium ion to other total ions in the ion active materials is from 10:1 to 25:1.	This element is met by the '483 Accused Products, each of which comprises "[t]he composition of claim 9 where the ratio of lithium ion to other total ions in the ion active materials is from 10:1 to 25:1." Specifically, as detailed above, each of the '483 Accused Products comprises "[t]he composition of claim 9." Further, each of the '483 Accused Products comprises a lithium ion such as Li⁺. Additionally, each of the '483 Accused Products comprises a PF6⁻ or similar Li⁺ counter-ion. Given the migratable nature of the Li⁺, its concentration within the cathode varies during charge and discharge processes but is configured to be within a 10:1 to 25:1 ratio at least when at approximately a 44% to 79% state of charge.