



# PETITIONER'S DEMONSTRATIVES FOR ORAL HEARING

***ZHUHAI COSMX BATTERY CO., LTD. v. NINGDE AMPEREX TECHNOLOGY LIMITED,  
No. IPR2025-00431***

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

**LEE & HAYES** 

# SUMMARY OF THE PROCEEDING



- Petition for *Inter Partes* Review of U.S. Patent No. 11,799,131 (Paper 1, “Petition”) raises grounds for invalidity
- Patent Owner’s Discretionary Denial Brief (Paper 10)
- Decision Referring the Petitions to the Board (Paper 14) denying Patent Owner’s Request
- Decision Granting Institution of *Inter Partes* Review 35 U.S.C. § 314 (Paper 15) instituting trial
- Patent Owner’s Response (Paper 28, “Response”)
- Petitioner’s Reply to Patent Owner’s Response to Petition for *Inter Partes* Review of U.S. Patent No. 11,799,131 (Paper 32, “Reply”)
- Patent Owner’s Sur-Reply (Paper 42, “Sur-Reply”)

# GROUNDINGS OF INVALIDITY



| Grounds |   | Claims                            | References                                                                                                                                                                                      |
|---------|---|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1       | A | 1, 2,<br>4-7,12,<br>14, 15,<br>17 | <ul style="list-style-type: none"><li>• China Patent Application Publication No. CN 106099187A (“Zeng”, EX1005)</li><li>• Japan Patent Application No. 2009-252349 (“Sunose”, EX1009)</li></ul> |
|         | B |                                   | <ul style="list-style-type: none"><li>• Zeng</li><li>• Sunose</li><li>• U.S. Patent Application Publication No. 2013/0224535 A1 (“Matsuoka”, EX1007)</li></ul>                                  |
|         | C |                                   | <ul style="list-style-type: none"><li>• Zeng; Zeng/Matsuoka</li><li>• Sunose</li><li>• U.S. Patent Application Publication No. 2017/0288268 A1 (“Kim”, EX1008)</li></ul>                        |

Petition, 18-19.

# GROUNDINGS OF INVALIDITY



| Grounds |   | Claims | References                                                                                                                  |
|---------|---|--------|-----------------------------------------------------------------------------------------------------------------------------|
| 2       | A | 3, 16  | <ul style="list-style-type: none"><li>• Zeng</li><li>• Sunose</li><li>• China Patent No. 108023117 (“Su”, EX1011)</li></ul> |
|         | B |        | <ul style="list-style-type: none"><li>• Zeng</li><li>• Sunose</li><li>• Matsuoka</li><li>• Su</li></ul>                     |
|         | C |        | <ul style="list-style-type: none"><li>• Zeng; Zeng/Matsuoka</li><li>• Sunose</li><li>• Su</li><li>• Kim</li></ul>           |

Petition, 18-19.

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# GROUNDINGS OF INVALIDITY



| Grounds |   | Claims                    | References                                                                                                                              |
|---------|---|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 3       | A | 1, 2, 4-7, 12, 14, 15, 17 | <ul style="list-style-type: none"><li>China Patent Application Publication No. CN 105552439 A (“Zhou”, EX1014)</li><li>Sunose</li></ul> |
|         | C |                           | <ul style="list-style-type: none"><li>Zhou</li><li>Sunose</li><li>Kim</li></ul>                                                         |

Petition, 18-19.

# GROUND S OF INVALIDITY



| Grounds |   | Claims | References                                                                                              |
|---------|---|--------|---------------------------------------------------------------------------------------------------------|
| 4       | A | 3, 16  | <ul style="list-style-type: none"> <li>• Zhou</li> <li>• Sunose</li> <li>• Su</li> </ul>                |
|         | C |        | <ul style="list-style-type: none"> <li>• Zhou</li> <li>• Sunose</li> <li>• Su</li> <li>• Kim</li> </ul> |

Petition, 18-19.

# '131 PATENT CLAIM 1



- [1.pre] *An electrochemical device, comprising:*
- [1.1] *an electrode; and*
- [1.2] *an electrolyte comprising a dinitrile compound, a trinitrile compound, and propyl propionate;*
- [1.3] *wherein, based on a total weight of the electrolyte, a weight percentage of the dinitrile compound is X, and a weight percentage of the trinitrile compound is Y; wherein, about  $2 \text{ wt } \% \leq (X+Y) \leq \text{about } 8 \text{ wt } \%$ , and about  $0.1 \leq (X/Y) \leq \text{about } 6$ ;*
- [1.4] *wherein, the electrode comprises a current collector,*
- [1.5] *a single-sided coating and a double-sided coating; a first part of the current collector is provided with the single-sided coating and a second part of the current collector is provided with the double-sided coating; and*
- [1.6] *an electrode compaction density of the electrode corresponding to the first part with the single-sided coating is D1, and, an electrode compaction density of the electrode corresponding to the second part with the double-sided coating is D2, wherein, about  $0.8 \leq D1/D2 \leq \text{about } 1.2$ ;*
- [1.7] *wherein based on the total weight of the electrolyte, a weight percentage of the propyl propionate is Z; wherein, about  $0.01 \leq (Y/Z) \leq \text{about } 0.3$ ;*
- [1.8] *wherein the trinitrile compound is one selected from the group consisting of 1,3,5-pentanetricarbonitrile; 1,2,3-propanetrinitrile; 1,3,6-hexanetricarbonitrile; 1,2,6-hexanetricarbonitrile; 1,2,3-tris(2-cyanoethoxy)propane; 1,2,4-tris(2-cyanoethoxy)butane; 1,1,1-tris(cyanoethoxymethylene)ethane; 1,1,1-tris(cyanoethoxymethylene)propane; 3-methyl-1,3,5-tris(cyanoethoxy)pentane; 1,2,7-tris(cyanoethoxy)heptane; 1,2,6-tris(cyanoethoxy)hexane; 1,2,5-tris(cyanoethoxy)pentane; and any combination thereof.*

# ZENG + SUNOSE (GROUNDS 1 & 2)



**Zeng and Sunose Render Obvious Claims 1, 2, 4-7, 12, 14, 15, and 17. Petition, 20-44.**

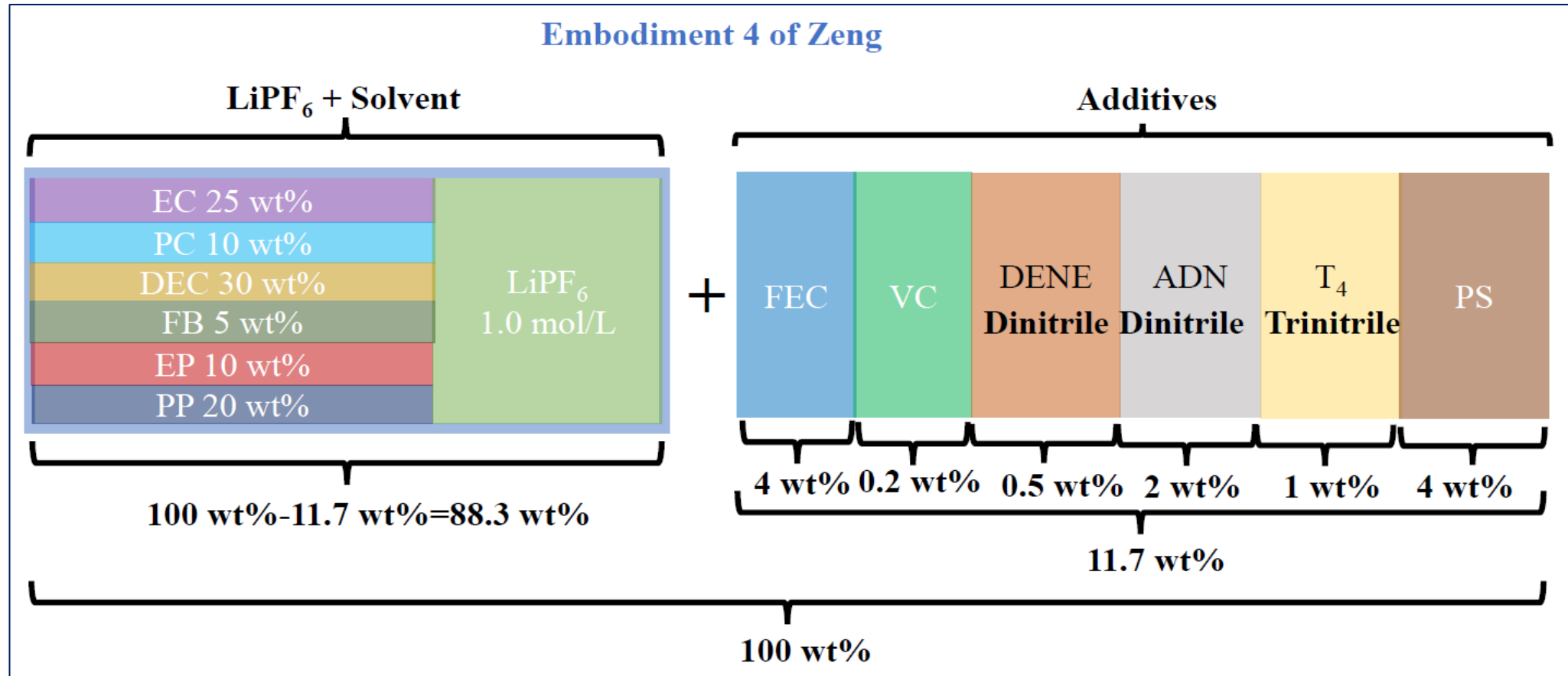
**Disputed issues:**

1. Whether Zeng discloses the Y/Z ratio (**claim element [1.7]**). Response, 6-14.
2. Whether Sunose discloses the D1, D2, or D1/D2 (**claim element [1.6]**). Response, 14-24.
3. Whether there was a motivation to combine Zeng + Sunose (**claim elements [1.5] & [1.6]**). Response, 24-26.

**PO does not dispute remaining claim elements, including dependent claims**

Claim 1: [1.pre]-[1.4], [1.8]; claims 2, 4-7, 12, 14, 15 and 17. See Response, 6-14.

# ZENG'S ELECTROLYTE

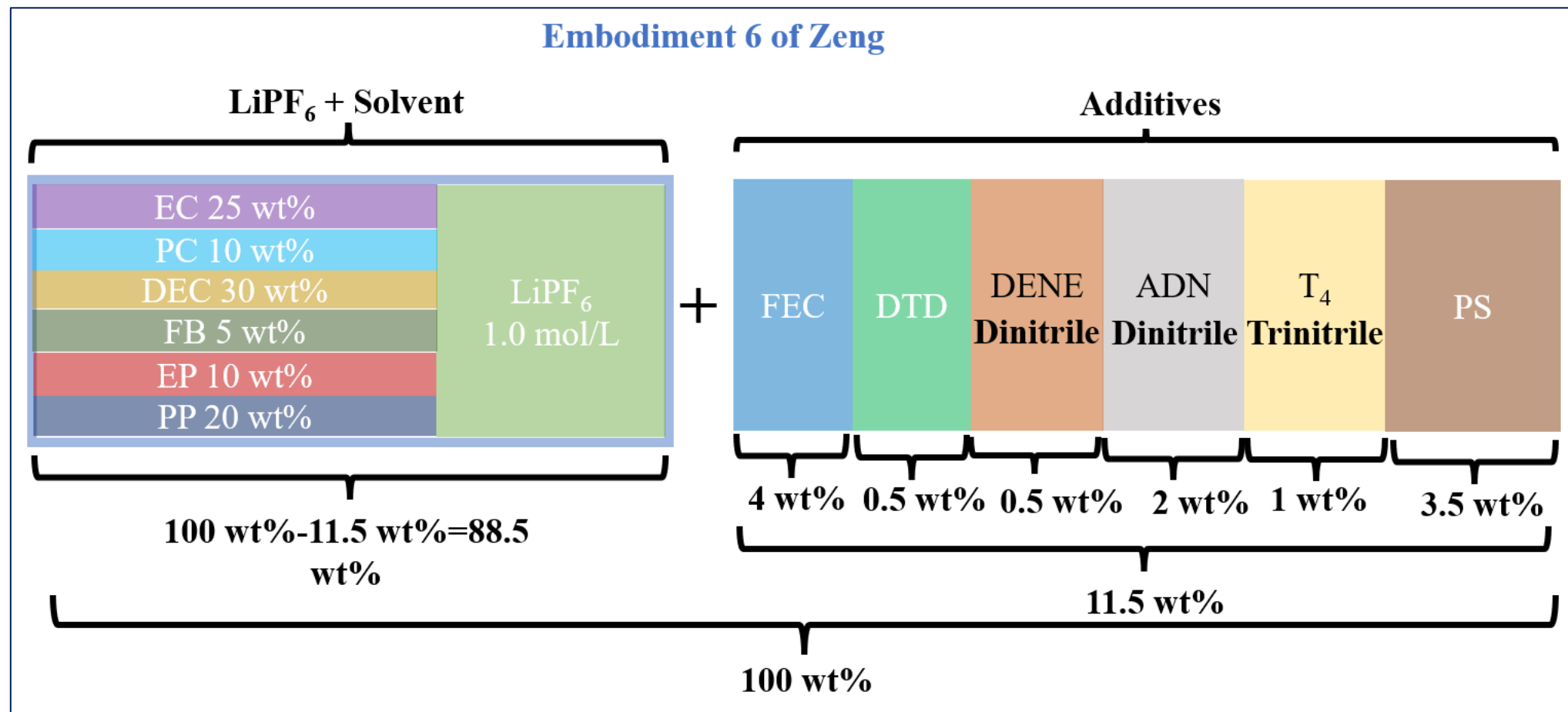


Petition, 23, EX1003, ¶ 84.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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# ZENG'S ELECTROLYTE



Petition, 24, EX1003, ¶ 84.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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# ZENG: Y/Z RATIO



| Embodiment | Y     | Z          | Y/Z    |
|------------|-------|------------|--------|
| 4          | 1 wt% | <17.66 wt% | >0.057 |
| 6          | 1 wt% | <17.70 wt% | >0.056 |

Petition, 39, EX1003, ¶ 128.

- Patent Owner does not dispute Zeng's Y (or Y/Z) under Dr. Lucht's analysis (solid  $\text{LiPF}_6$ ). Response, 6-14.
- Patent Owner only disputes Zeng's Z disclosure based on one phrase:

propionate are mixed at a mass ratio of EC:PC:DEC:FB:EP:PP = 25:10:30:5:10:20; then, lithium hexafluorophosphate of a concentration of 1.0 mol/L is slowly added to the mixed solution.

EX1006, ¶ [0037]; Response, 8-13.

# POSITA IS SOPHISTICATED



## V. PERSON OF ORDINARY SKILL IN ART

A person of ordinary skill in the art (“POSITA”) of the ’131 Patent in September 2018 would have an **advanced degree** in chemistry, chemical engineering, materials science, or a related field, **and two or more years of experience** related to the design, research, evaluation, preparation, and/or manufacture of electrochemical energy storage devices. *See* EX1003, ¶17; EX1001, 1:18-20. This level of skill is approximate, and more experience could compensate for less formal education, and vice versa.

Petition, 16.

For purposes of this POR, **ATL adopts the definition proposed by Petitioner.**

Pet., 16; Ex. 2015 ¶¶54-56; Ex. 2047 ¶¶20-22.

Response, 5.

# POSITA WOULD HAVE KNOWN $\text{LiPF}_6$ IS ADDED AS A SOLID



- Translated from Chinese – POSITA would use their knowledge and experience to interpret correctly. Reply, 4.
- Common practice to add as solid to a solvent mixture. Reply, 2-3.
- 1.0 molar  $\text{LiPF}_6$  is typical for electrolytes. Reply, 4.

18. In my opinion, the logical and obvious interpretation is a POSITA would simply have added solid  $\text{LiPF}_6$  to the specified EC/PC/DEC/FB/EP/PP solvent mixture until reaching a concentration of 1.0 M because that's conventional practice with an already-specified solvent recipe. See, e.g., EX1023, ¶¶[0237], [0245], [0255]; EX1024, ¶[0048], EX1025, ¶[0090]; EX1008, ¶[0091]; EX1015, ¶¶[0034]-[0036]; EX1047, ¶¶[171], [176]; EX2022, ¶¶[0030], [0057] While the

EX1044, ¶ 18.

|    |                                                 |
|----|-------------------------------------------------|
| 11 | Q And going back in time, the industry          |
| 12 | standard electrolyte formulations are typically |
| 13 | around 1 molar, correct?                        |
| 14 | A Typically, yes.                               |
| 15 | Q And that is generally commercially            |
| 16 | available and known?                            |
| 17 | A Yes.                                          |

EX2050, 81:11-17.

# DR. WHEELER USES 1.0 MOLAR $\text{LiPF}_6$



## Research Activities of the Wheeler Group

### Particle simulation tools

The group has especial expertise in performing **molecular-scale and mesoscale computer simulations**, such as molecular dynamics, to elucidate the connections between microscopic and macroscopic behavior--that is, how the interactions of molecules or particles influence thermodynamic and transport properties of materials. The simulations serve as a means of estimating or predicting properties when experimental data is difficult to obtain.

Below is shown a configuration snapshot from a molecular dynamics simulation of **1 molar  $\text{LiPF}_6$**  in propylene carbonate solvent, an electrolyte used in lithium batteries. The red balls are lithium ions, the blue “jacks” are  $\text{PF}_6^-$  anions.

# CRITICALITY ARGUMENT FAILS



## Criticality doctrine does not apply

- Only applies when prior art teaches a range overlapping or encompassing claimed range. Reply, 5-6.
- Zeng's disclosed Y/Z ratio is entirely within the claimed range. Reply, 6.

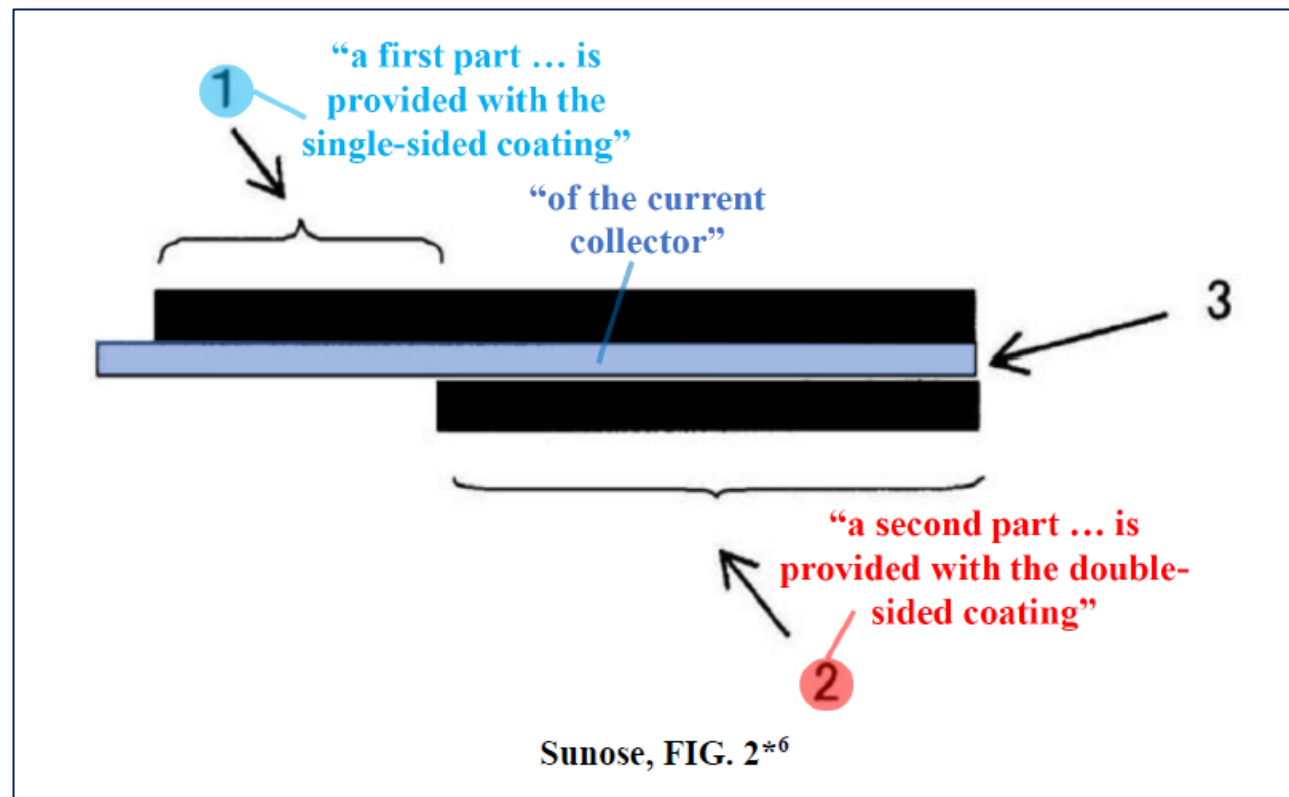
## Y/Z range is not critical

- PO's burden. Reply, 6.
- Only evidence is PO's self-serving statements in specification. Reply, 6.
- 11% or 16% improvement in inhibiting DC internal resistance rise is a difference "merely in degree," not a "new and unexpected result which is different in kind...from results of the prior art." *E.I. DuPont de Nemours & Co. v. Synvina C.V.*, 904 F.3d 996, 1006 (Fed. Cir. 2018); Reply, 7.
- D2-4 (out-of-range example) outperforms many in-range examples. Reply, 7-8.
- Cannot attribute performance to Y/Z. Reply, 8.

| TABLE 2 |               |                            |                            |        |                                           |                     |                     |
|---------|---------------|----------------------------|----------------------------|--------|-------------------------------------------|---------------------|---------------------|
|         |               |                            |                            |        | DC internal resistance<br>(mΩ) at 20% SOC |                     |                     |
|         | C<br>(Z wt %) | A <sub>1</sub><br>(X wt %) | B <sub>1</sub><br>(Y wt %) | Y/Z    | Fresh<br>battery                          | After 200<br>cycles | After 400<br>cycles |
| S1-1    | 30            | 4                          | 1                          | 0.03   | 50.8                                      | 84.3                | 91.2                |
| S2-1    | 5             | 4                          | 1                          | 0.2    | 68.7                                      | 85.2                | 97.6                |
| S2-2    | 10            | 4                          | 1                          | 0.1    | 60.3                                      | 83.1                | 95.7                |
| S2-3    | 20            | 4                          | 1                          | 0.05   | 56.1                                      | 81.6                | 93.9                |
| S2-4    | 40            | 4                          | 1                          | 0.025  | 47.5                                      | 78.2                | 87.2                |
| S2-5    | 50            | 4                          | 1                          | 0.02   | 56.3                                      | 82.6                | 98.3                |
| S2-6    | 10            | 4                          | 3                          | 0.3    | 64.3                                      | 89.5                | 97.7                |
| S2-7    | 50            | 4                          | 0.5                        | 0.01   | 53.2                                      | 84.3                | 94.1                |
| D2-1    | 4             | 4                          | 1                          | 0.25   | 72.1                                      | 108.5               | 118.9               |
| D2-2    | 60            | 4                          | 1                          | 0.017  | 42.0                                      | 100.1               | 113.9               |
| D2-3    | 10            | 4                          | 5                          | 0.5    | 62.3                                      | 85.4                | 111.3               |
| D2-4    | 50            | 4                          | 0.1                        | 0.0025 | 53.2                                      | 89.3                | 109.4               |

EX1001, Table 2.

# SUNOSE'S ELECTRODES



# SUNOSE DISCLOSES D1/D2



- Packing/Active Material Density = Compaction Density. Reply, 10-11; Petition, 34.
- Density is always mass/volume. Reply, 11.
- Compaction Density can be measured after compaction or calculated via coat weight and roller gap thickness. Reply, 11-12.

3           So if you know the mass of the material  
4 and the volume to which it's being compacted, you  
5 can calculate the compaction density, right?

6       **A. If you correctly know those properties,**  
7 **yes.**

8       Q. And Sunose is just compacting a known  
9 mass of active material to a known volume using a  
10 fixed gap roll press, right?

11       **A. Correct, which, in my mind, makes it all**

Wheeler Depo. (EX1045), 85:3-11.

5       **A. Therefore, by varying the thickness of**  
6 **the single-sided active material portion and the**  
7 **thickness of the two-sided active material portion**  
8 **during the application of the active material, and**  
9 **performing a fixed-size press using a rolling**  
10 **machine, the prescribed active material density**  
11 **ratio is obtained.**

12       Q. So you'd agree that description is  
13 describing a compaction, right?

14       **A. Correct, they did -- it appears they**  
15 **compacted their materials using a rolling press**  
16 **machine.**

Wheeler Depo. (EX1045), 80:5-16.

# SUNOSE DISCLOSES D1/D2



- Examples 3 and 4 fall below Dr. Wheeler's purported theoretical maximum of 4.5 g/cm<sup>3</sup>. Reply, 9.
- Compaction densities above theoretical maximum were likely due to attempting to compact too much active material through the fixed roll-press gap. Reply, 12.
- Comparative Example 3 broke, likely due to this. Reply, 12.

| Example | <i>D1</i> (g/cm <sup>3</sup> ) (M) | <i>D2</i> (g/cm <sup>3</sup> ) (N) <sup>7</sup> | <i>D1/D2</i> |
|---------|------------------------------------|-------------------------------------------------|--------------|
| 2       | 5.0                                | 4.0                                             | 1.25         |
| 3       | 4.4                                | 4.0                                             | 1.1          |
| 4       | 4.0                                | 4.0                                             | 1.0          |

Petition, 33, EX1003, ¶ 115.

The positive electrode plate in comparative example 3 could not undergo a bending test due to breakage of the active material layer occurring on the single-side active material portion when rolling using a roll press machine.

EX1010, ¶ [0040].

# SUNOSE DISCLOSES D1/D2



## Sunose broadly discloses D1/D2 range of 1-1.43:

### [Claim 2]

The method for manufacturing an electrode plate for a non-aqueous electrolyte secondary battery according to claim 1, wherein a portion of the active material layer on a single side of the electrode plate at the outermost circumference of the battery is removed, and with the packing density of the active material layer on the opposite side thereof through the current collector as M and the packing density of the active material layer of the other electrode plate at the inner circumference as N, the ratio of N to M is  $0.7 < N / M < 1.0$ .

EX1010, Claim 2.

- Patent Owner and Dr. Wheeler do not dispute Sunose's broader disclosures. Sur-reply (Paper 42), 12-13.
- Cited in Petition, 33.
- Proper rebuttal of Patent Owner's arguments.

# SUNOSE IS ENABLED



- Enablement not required. *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1357 (Fed. Cir. 2003). Reply, 13
- Sunose gives sufficient instruction, requiring minimal/routine fine-tuning. Reply, 13-14.
- Compaction density is varied by varying the coat weight. Reply, 13-14.

48. Sunose's fixed-press compacts both active material coatings to a fixed volume equal to the known surface area of the electrode plate  $\times$  (the known fixed gap between the rollers – the known electrode plate thickness). With that fixed volume known, a POSITA need only apply simple algebra: coating amount = (target compaction density)  $\times$  (fixed volume). This is exactly what my students and I have done in my lab—no undue experimentation needed. And to the extent results deviate from the formula, it is my opinion that any adjustment would just routine fine-tuning, not undue experimentation. Thus, in my opinion, Sunose provides sufficient guidance for a POSITA to determine the coat weight for a specified compaction density without undue experimentation.

EX1044, ¶ 48.

[0029]

(Embodiment 1)

To the positive electrode current collector 4 made of strip-shaped aluminum foil, 100 parts by weight of powder of LiCoO<sub>2</sub> produced by Nichia Chemical, which is an active material, is mixed with 5 parts by weight of Denka Black, 4 parts by weight of a binder such as polyvinylidene fluoride (PVDF) is added thereto, and this was used as a thickening agent. This is then diluted with 7 parts by weight of a solvent of N-methyl-2-pyrrolidone produced by Mitsubishi Chemical, dispersion mixing was performed, and the prepared positive electrode coating is applied using a coating device at a speed of 15 m/min at a drying temperature of 200°C, and after applying a coating of 60 cm on the surface with an active material layer weight of 200 g/cm<sup>2</sup>, the 10 cm coating is stopped. This process is repeated to create an electrode plate wherein portions that have the active material on the current collector and portions that have only the current collector intermittently exist.

[0030]

The coating on the rear side is the same as that of the front side, that is, 50 cm is applied at a drying temperature of 200°C, at a speed of 15 m/min, so that the weight of the active material layer on both sides of the applied portion reaches 400 g/cm<sup>2</sup>, then the application is stopped at 20 cm. On the single-side coated portion 1, the coating device was used again to apply the positive electrode coating at a drying temperature of 200°C, at a speed of 15 m/min, so that the weight of the active material layer 120 g/cm<sup>2</sup>.

[0033]

(Embodiment 3)

Next, the positive electrode plate of embodiment 3 was created by rolling after changing the coating amount of the single-side coated portion 1 while keeping the same active material density of the two-side coated portion 2, and creating a positive electrode plate by changing so that the active material density of the single-side coated portion 1 is 4.4 g/cc.

[0034]

(Embodiment 4)

Additionally, the positive electrode plate of embodiment 4 was created by rolling after changing the coating amount of the single-side coated portion 1 while keeping the same active material density of the two-side coated portion 2, and creating a positive electrode plate by changing so that the active material density of the single-side coated portion 1 is 4.0 g/cc.

EX1010, ¶¶ [0029]-[0030], [0033]-[0034].

# D1/D2 NOT “CRITICAL”



- Sunose Examples 3 & 4 are within the claimed range, so criticality doctrine does not apply. Reply, 14.
- 131 Patent and Patent Owner fail to demonstrate criticality. At best, improved results are incremental (a few percent better), not different in kind. Reply, 14-15.

| TABLE 7 |                                        |                         |                     |                     |
|---------|----------------------------------------|-------------------------|---------------------|---------------------|
|         | Compaction<br>density ratio<br>(D1/D2) | Capacity retention rate |                     |                     |
|         |                                        | Fresh<br>battery        | After 200<br>cycles | After 400<br>cycles |
| S7-1    | 0.8                                    | 100%                    | 93.8%               | 89.3%               |
| S7-2    | 0.9                                    | 100%                    | 95.3%               | 90.1%               |
| S7-3    | 0.95                                   | 100%                    | 95.9%               | 90.8%               |
| S7-4    | 1.0                                    | 100%                    | 96.8%               | 91.4%               |
| S7-5    | 1.05                                   | 100%                    | 95.8%               | 90.7%               |
| S7-6    | 1.1                                    | 100%                    | 95.2%               | 90.2%               |
| S7-7    | 1.2                                    | 100%                    | 93.7%               | 88.8%               |
| D7-1    | 1.3                                    | 100%                    | 91.2%               | 83.6%               |
| D7-1    | 0.7                                    | 100%                    | 90.5%               | 82.7%               |

EX1001, Table 7.

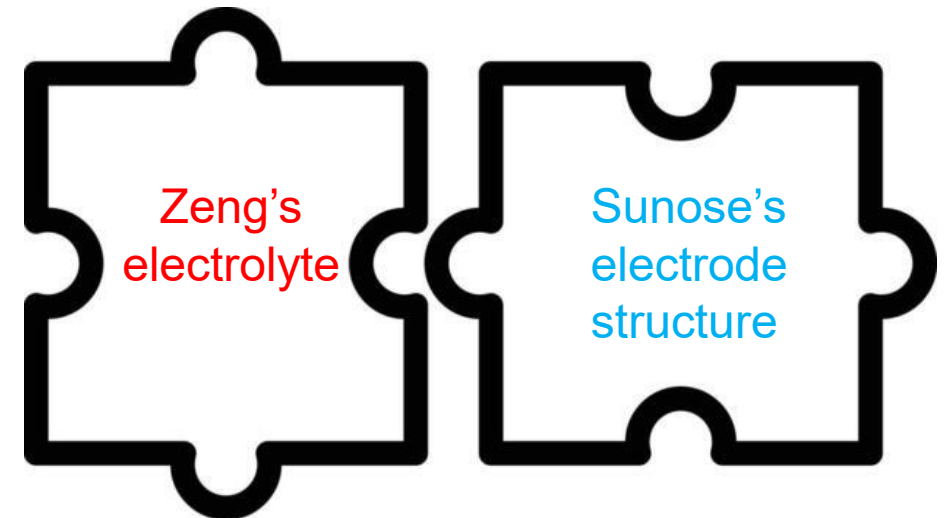
# POSITA WOULD HAVE COMBINED ZENG + SUNOSE



- Analogous art: lithium-ion batteries. Petition, 36.
- Zeng teaches electrolyte but no electrode structure. Petition, 36; Reply 16-17.
- Sunose teaches electrode structure but not electrolyte. Reply, 17.
- Sunose maximizes electrode area, increases adhesion, minimizes breakage. Petition, 37-38.
- Rolled/spiral is one of the two most common electrode configurations. Reply, 15-16.
- No undue experimentation. Reply, 17-18.

**11 A There are. I mean, typically in terms of 12 commercial cells they're either prismatic cells or 13 they're rolled cells. But once again, if you are**

EX2050, 149:11-13.



# MATSUOKA (GROUNDS 1B, 1C, 2B, 2C)



- Only relied on for teaching a specific amount of PP – Zeng already uses PP. Petition, 49-51; Reply, 18.
- Whether other changes would improve Zeng is irrelevant. Obviousness combination need not be the “best option,” just “suitable.” *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 800 (Fed. Cir. 2021); Reply, 19.
- Bodily incorporation of every feature of Matsuoka not required. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981); Reply, 19.
- PO contradicts their “complexity” argument, suggesting a POSITA would make numerous “unpredictable” changes to Zeng’s electrolyte. Reply, 19-20.

# CLAIMS 3 & 16



- Claims 3 and 16 narrow claim 1 so D1/D2 is specific to the anode.
- Dispute: whether Sunose applies to the anode. Response, 47-48.
- Answer: YES. Reply, 22.
- No dispute as to Su's disclosure. Response, 47-48.

[0021]

In the present invention, in a battery configured by a positive electrode plate and a negative electrode plate being wound in a spiral through a separator, a portion of the active material layer on a single side of the electrode plate at the outermost periphery of the battery is removed, and with the packing density of the active material layer on which coating has been applied and dried on the opposite side through a current collector as M and the packing density of the active material layer on which coating has been applied and dried on another electrode plate on the inner circumference as N, the ratio of the packing density M and the packing density N is made to be  $0.7 < N / M < 1.0$ , the thickness of the single-sided active material layer portion that has been coated is larger than the two-sided active material layer that has been coated, the pressure applied to the single-sided active material portion during rolling increases, thereby increasing the adhesion. Breakage of the electrode plate during battery winding and detachment of the active material layer from the current collector can be eliminated, thereby improving productivity.

EX1010, ¶ 21.

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

LEE & HAYES

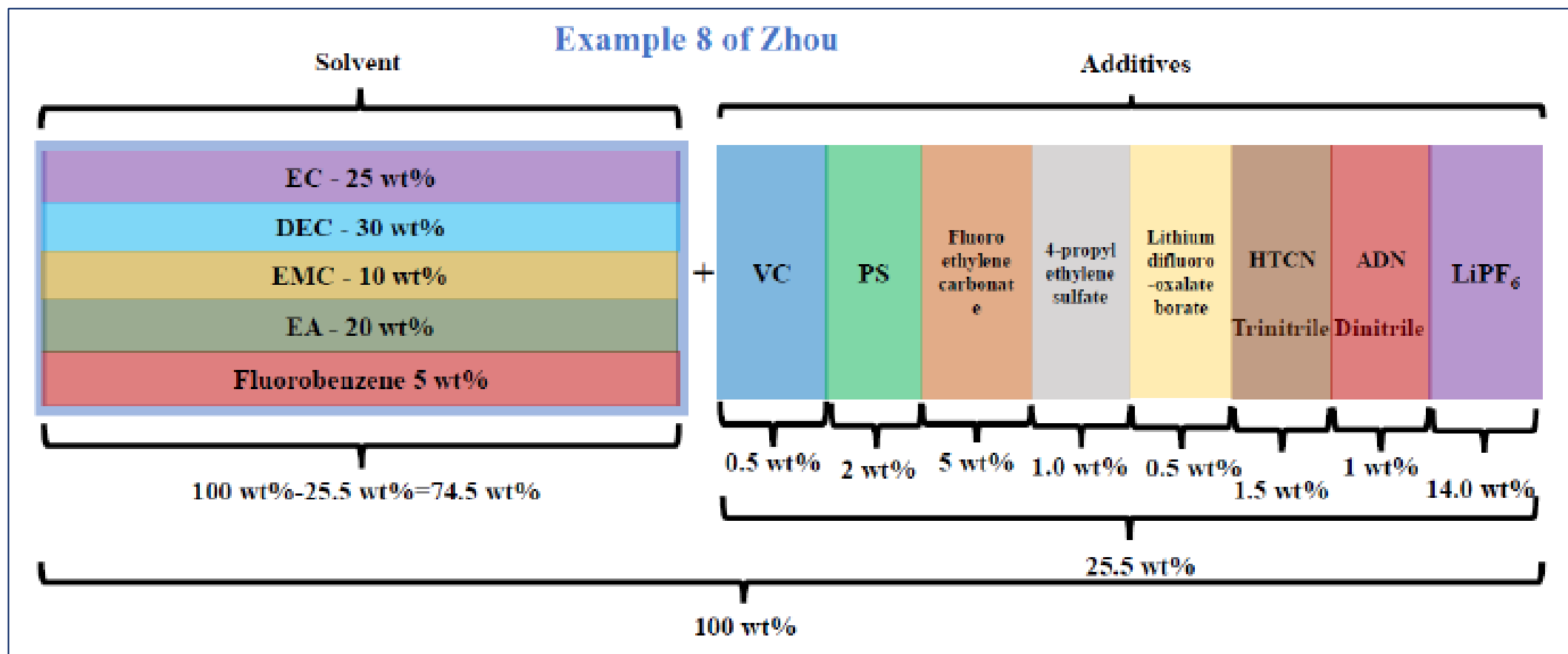
# ZHOU (GROUNDS 3 & 4)



## Disputes:

1. Whether a POSITA would have chosen Zhou Example 8.  
Response, 48-53.
2. Whether EA would have been substituted with PP.  
Response, 54-58.

# ZHOU EXAMPLE 8



Petition, 63; EX1003, ¶ 203.

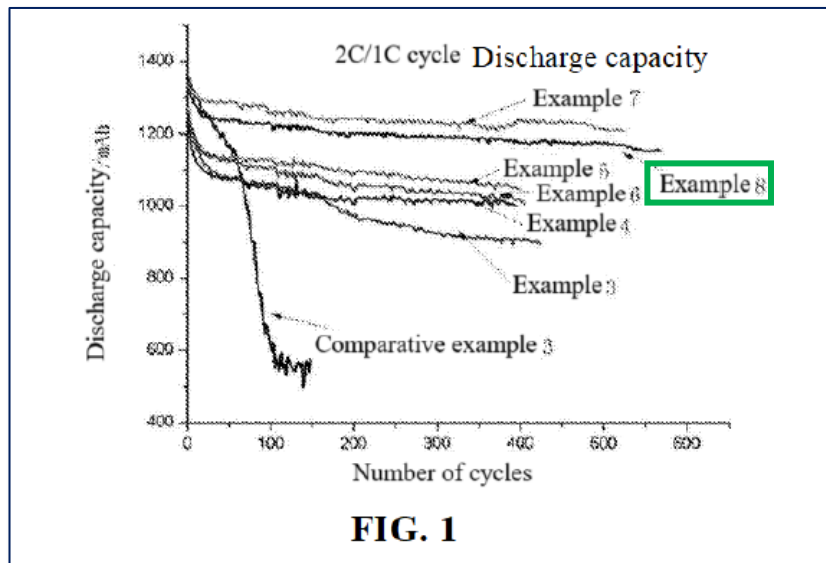
DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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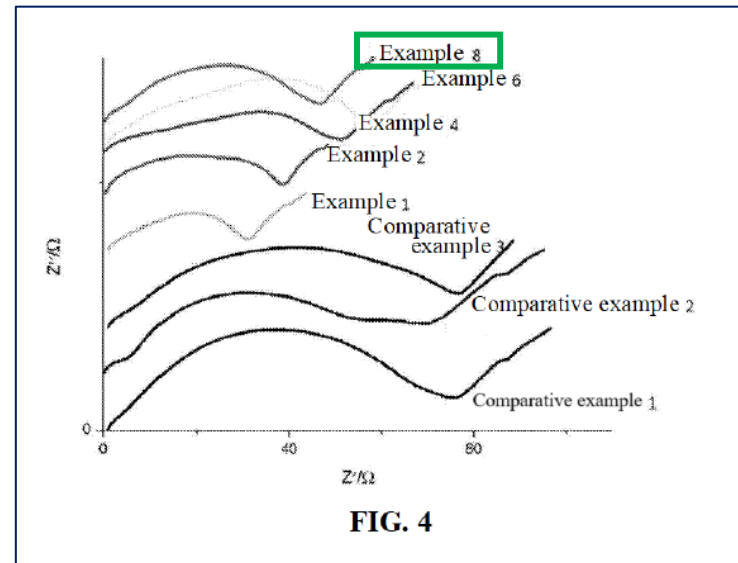
# ZHOU EXAMPLE 8



- Example 8 need not be the best example. Reply, 23-24.
- Example 8 performed well (Reply, 24; Petition, 64):



EX1014, Fig. 1.



EX1014, Fig. 4.

1 examples that were tested, you agree that example 8  
2 performed the second best in retaining its discharge  
3 capacity, correct?  
4 A. Yes, I agree that by the end of the test,  
5 example 8 was second best of those that were tested  
6 in this test and reported.

Wheeler Depo. (EX1045), 124:1-6.

22 Q. So going back to Figure 4, you'd agree  
126  
1 that example 8 performed better than the comparative  
2 examples, right?  
3 A. On this measure, yes.  
4 Q. And it also appears that example 8  
5 performed better than example 4; is that right?  
6 A. Yes.  
7 Q. And then it appears that example 8  
8 performed better than example 6 as well.  
9 A. Yes, but it did not perform better than  
10 examples 1 and 2.

Wheeler Depo. (EX1045), 125:22-126:10.

# SUBSTITUTING EA FOR PP



## Zhou teaches substituting EA for PP

[0011] The linear carboxylic acid ester is at least one of propyl propionate, ethyl propionate, propyl acetate, butyl propionate, ethyl acetate, isopropyl propionate, ethyl butyrate, and methyl acetate.

EX1014, ¶ [0011]; Petition, 60; Reply, 25.

Dr. Wheeler confirms predictable results – increase in boiling and melting points.

molecule and such substitution would increase both the melting point and the boiling point relative to the smaller ethyl acetate molecule, which defeats Zhou's identified purpose of using this solvent component.

Wheeler Declaration (EX2015), ¶ 273; Reply, 26.



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**CERTIFICATE OF SERVICE (37 C.F.R. §§ 42.6(e), 42.105(a))**

I certify that the above-captioned PETITIONER'S DEMONSTRATIVES FOR ORAL ARGUMENT was served in its entirety upon the Patent Owner on May 8, 2026, and again on May 15, 2026, after filing with the PTAB, by email as follows:

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Respectfully submitted,

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Date: May 15, 2026