

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMPEREX TECHNOLOGY LTD.

Petitioner

v.

SEMICONDUCTOR ENERGY LABORATORY CO., LTD.

Patent Owner.

IPR2023-01349

U.S. Patent No. 11,043,660

DECLARATION OF JAMES L. MULLINS, Ph.D.

I. INTRODUCTION

I, James L. Mullins, am above the age of majority and hereby declare under penalty of perjury:

1. I have been retained by counsel for Amperex Technology Ltd. (“Amperex”) to analyze and opine on the authenticity and public accessibility of certain documents referenced herein.

2. I am presently Dean Emeritus of Libraries and Esther Ellis Norton Professor Emeritus at Purdue University. My career as a professional and academic/researcher spanned more than 44 years, including library positions at Indiana University, Villanova University, Massachusetts Institute of Technology, and Purdue University. Attachment C is a true and correct copy of my curriculum vitae describing my background and experience.

3. In 2018, I founded the firm Prior Art Documentation Librarian Services, LLC, now located at 205 Saint Cuthbert, Williamsburg, VA 23188. Further information about my firm, Prior Art Documentation Librarian Services, LLC (PADLS), is available at www.priorartdoclib.com.

4. For my services in connection with this case, I bill at my usual and customary hourly fee of \$275.00. I have no stake in the outcome of this proceeding

or any related litigation or administrative proceedings, and my compensation in no way depends on the substance of my testimony or the outcome of this proceeding.

5. As part of my preparation for completing this report, I have reviewed and considered the materials identified in this report.

II. QUALIFICATIONS

6. I received a Bachelor of Arts degree in History, Religion and Political Science in 1972 as well as a Master of Arts degree in Library Science in 1973, both from the University of Iowa. I received my Ph.D. in Academic Library Management in 1984 from Indiana University. Over forty-four years, I have held various positions, and I am considered a leader in the field of library and information sciences.

7. I am currently Dean Emeritus of Libraries and Esther Ellis Norton Professor Emeritus at Purdue University, 2018 – present. I was previously employed as follows:

i) Dean of Libraries and Esther Ellis Norton Professor, Purdue University, West Lafayette, IN, 2004 – 2017;

ii) Assistant/Associate Director for Administration, Massachusetts Institute of Technology (MIT) Libraries, Cambridge, MA 2000 – 2004;

- iii) University Librarian and Director, Falvey Memorial Library, Villanova University, Villanova, PA, 1996 – 2000;
- iv) Director of Library Services, Indiana University South Bend, South Bend, IN, 1978 – 1996;
- v) Part-time Instructor, School of Library and Information Science, Indiana University, Bloomington, IN, 1979 – 1996;
- vi) Associate Law Librarian, and associated titles, Indiana University School of Law, Bloomington, IN, 1974 – 1978;
- vii) Catalog Librarian, Assistant Professor, Georgia Southern College (now University), Statesboro, GA, 1973 – 1974.

8. I am a member of the American Library Association (“ALA”), where I served as the chair of the Research Committee of the Association of College and Research Libraries (“ACRL”). My service to ALA included service on the editorial board of the most prominent library journal, *College and Research Libraries*. I also served on the Standards Committee, College Section of the ACRL, where I was instrumental in developing a re-issue of the *Standards for College Libraries* in 2000.

9. I am an author of numerous publications in the field of library science and have given presentations in library sciences at national and international conferences. During more than 44 years as an academic librarian and library science scholar, I have gained extensive experience with techniques and systems for

cataloging and indexing printed materials in the library setting, including catalog records and online library management systems built using Machine-Readable Cataloging (“MARC”) standards. As an academic library administrator, I have had responsibility to ensure that students were educated to identify, locate, assess, and integrate information garnered from research library resources. I have also facilitated the research of faculty colleagues either directly or through the provision of and access to the requisite print and/or digital materials and services at the universities where I worked.

10. Based on my experience identified above and detailed in my curriculum vitae, which is attached hereto as Attachment C, I consider myself to be an expert in the field of library science and academic library administration. I have previously offered my opinions on the public accessibility and authenticity of documents in over 118 cases. I have been deposed in one case.

III. LEGAL STANDARDS

11. I am not a lawyer. My understanding of the legal standards to apply in reaching the conclusions in this declaration is based on discussions with counsel for Petitioner, my experience applying similar standards in other patent-related matters, and my reading of the documents related to this proceeding. In preparing this declaration, I have tried to faithfully apply these legal standards to the authenticity

of the documents referenced herein and whether, when, and how these documents were publicly accessible.

Authentication

12. I have been informed by counsel and understand that an item is considered authentic if there is sufficient evidence to support a finding that the item is what it is claimed to be by the proponent of the item. I have also been informed that authenticity can be established based on the properties of the item itself, such as the appearance, content, substance, internal patterns, or other distinctive characteristics of the item.

Public Accessibility

13. I have been informed by counsel and understand that a given reference qualifies as publicly accessible if it were disseminated or otherwise made available such that persons interested and ordinarily skilled in the relevant subject matter could locate it through the exercise of ordinary diligence.

14. I have been informed by counsel and understand that the determination of public accessibility under the foregoing standard rests on a case-by-case analysis of the facts particular to an individual publication. However, I also understand that one way that public accessibility can be shown is if a publication is cataloged and indexed by a library such that a person interested in the relevant subject matter could

locate it. In other words, I understand that cataloging and indexing by a library, such that a person interested in the relevant subject matter could locate the reference, is sufficient to render it publicly accessible, though there are other ways that a given reference may qualify as publicly accessible. One manner of sufficient indexing is indexing according to subject matter. I have been informed by counsel and understand that it is not necessary to prove someone actually looked at the reference in order to show it was publicly accessible by virtue of a library's cataloging and indexing thereof. I understand that cataloging and indexing of a particular printed publication can indicate that the publication is publicly accessible.

15. I also understand that there are other ways that a given reference may be deemed publicly accessible, including where that reference is cited by others in the field.

The Critical Date

16. I have been informed by counsel that for purposes of this declaration I should consider evidence of public accessibility prior to July 5, 2016. As described further below, I have concluded that each of the references discussed herein was publicly accessible, including to a Person of Ordinary Skill in the Art, prior to July 5, 2016.

The Person of Ordinary Skill in the Art

17. I have been informed by counsel that a person of ordinary skill in the art at the time of the inventions (“POSITA”) is a hypothetical person who is presumed to be familiar with the relevant field and its literature at the time of the inventions. This hypothetical person is also a person of ordinary creativity, capable of understanding the scientific principles applicable to the pertinent field.

18. In addition, I have been informed by counsel that as relevant to these proceedings, the POSITA would have the skills of one or more individuals with at least a bachelor’s degree in chemistry, chemical engineering, or materials science and at least five years of experience in the field of batteries and battery materials. Individuals with different education and additional experience could still be of ordinary skill in the art if that additional experience compensates for a deficit in their education and experience.

Background of Library Catalog Records and other Resources

19. Some background on MARC formatted records, the Online Computer Library Center (“OCLC”), and *WorldCat* is helpful to understand the library catalog records discussed in this report. I am fully familiar with the library cataloging standard known as the MARC standard, which is an industry-wide standard method

of storing and organizing library catalog information.¹ MARC practices have been consistent since the MARC format was developed by the Library of Congress in the 1960s, and by the early 1970s became the U.S. national standard for disseminating bibliographic data. By the mid-1970s, the MARC format became the international standard, and it persists as such through the present. A MARC-compatible library is one that has a catalog consisting of individual MARC records for each of its items. The underlying MARC format underpins the online public access catalog (“OPAC”) that is available to library users to locate a particular holding of a library. Today, MARC is the primary communications protocol for the transfer and storage of bibliographic metadata in libraries.² The MARC practices discussed below were in place during the time frames relevant to the documents referenced herein.

¹ The full text of the standard is available from the Library of Congress at <http://www.loc.gov/marc/bibliographic/>.

² Almost every major library in the world uses a catalog that is MARC-compatible. See, e.g., Library of Congress, *MARC Standards Frequently Asked Questions (FAQ)*, available at <https://www.loc.gov/marc/faq.html> (last visited Jan. 24, 2018).

“MARC is the acronym for MACHine-Readable Cataloging. It defines a data format that emerged from a Library of Congress-led initiative that began nearly

20. OCLC is a not-for-profit worldwide consortium of libraries. Similar to MARC standards, OCLC's practices have been consistent since the 1970s through the present. Accordingly, the OCLC practices discussed below were in place during the time frame discussed in my opinions section. OCLC was created "to establish, maintain and operate a computerized library network and to promote the evolution of library use, of libraries themselves, and of librarianship, and to provide processes and products for the benefit of library users and libraries, including such objectives as increasing availability of library resources to individual library patrons and reducing the rate of rise of library per-unit costs, all for the fundamental public purpose of furthering ease of access to and use of the ever-expanding body of worldwide scientific, literary and educational knowledge and information."³ Among

forty years ago. It provides the mechanism by which computers exchange, use, and interpret bibliographic information, and its data elements make up the foundation of most library catalogs used today." *Id.* MARC is the ANSI/NISO Z39.2-1994 (reaffirmed 2009) standard for Information Interchange Format.

³ OCLC Online Computer Library Center, Inc., Amended Articles of Incorporation of OCLC Online Computer Library Center, Inc., Third Article (OCLC, Dublin, Ohio) Revised June 23, 2017, available at

other services, OCLC and its members are responsible for maintaining the WorldCat database (<http://www.worldcat.org/>), used by libraries throughout the world.

21. Libraries worldwide use the machine-readable MARC format for catalog records. MARC-formatted records include a variety of subject access points based on the content of the document being cataloged. A MARC record for a particular work comprises several fields, each of which contains specific data about the work. Each field is identified by a standardized, unique, three-digit code corresponding to the type of data that follows. For example, a work's title is recorded in field 245, the primary author of the work is recorded in field 100, a work's International Standard Book Number ("ISBN") is recorded in field 020, and the work's Library of Congress call number (assigned by the Library of Congress) is recorded in field 050. Some fields can contain subfields, which are indicated by letters. For example, a work's publication date is recorded in field 260 under the subfield "c."

22. The MARC Field 040, subfield "a," identifies the library or other entity that created the catalog record in the MARC format. MARC Field 008 identifies the date when this first MARC record was created.

<https://www.oclc.org/content/dam/oclc/membership/articles-of-incorporation.pdf>.

23. MARC records also include several fields that include subject matter classification information. An overview of MARC record fields is available through the Library of Congress at <http://www.loc.gov/marc/bibliographic/>. For example, 6XX fields are termed “Subject Access Fields.”⁴ Among these, for example, is the 650 field; this is the “Subject Added Entry - Topical Term (R)” field. *See* <http://www.loc.gov/marc/bibliographic/bd650.html>. The 650 field is a “[s]ubject added entry in which the entry element is a topical term.” *Id.* The 650 field entries “are assigned to a bibliographic record to provide access according to generally accepted thesaurus-building rules (*e.g.*, *Library of Congress Subject Headings* (LCSH), *Medical Subject Headings* (MeSH)).” *Id.* Thus, a researcher can easily discover material relevant to a topic of interest with a search using the terms employed in MARC Fields 6XX.

24. Further, MARC records include call numbers, which themselves include a classification number. For example, the 050 field is dedicated as the “Library of Congress Call Number (R)”⁵ as assigned by the Library of Congress. A defined portion of the Library of Congress Call Number is the classification number;

⁴ *See* <http://www.loc.gov/marc/bibliographic/bd6xx.html>.

⁵ *See* <http://www.loc.gov/marc/bibliographic/bd050.html>.

the “source of the classification number is *Library of Congress Classification* and the *LC Classification-Additions and Changes*.” *Id.* (emphases in original). Thus, included in the 050 field is a subject matter classification. As an example: TK5105.59 indicates books on computer networks - security measures. When a local library assigns a classification number -- most often a Library of Congress derived classification number created by a local library cataloger, but sometimes a Dewey Decimal classification number such as, for example, “005.8, computer networks - security measures” -- that classification number appears in the 090 field. In either scenario, the MARC record includes a classification number in the call number field that represents a subject matter classification.

25. *WorldCat* is the world’s largest public online catalog. It is maintained by the OCLC, a not-for-profit international library consortium, and built with the records created by the thousands of libraries that are members of OCLC. OCLC provides bibliographic and abstract information to the public based on MARC-compliant records through its OCLC *WorldCat* database. *WorldCat* requires no knowledge of MARC tags and codes and does not require a login or password. *WorldCat* is easily accessible through the World Wide Web to all who wish to search it; there are no restrictions to be a member of a particular community, etc. The date a given catalog record was created (corresponding to the MARC Field 008) appears in some detailed *WorldCat* records as the Date of Entry but not necessarily all.

WorldCat does not provide a view of the underlying MARC format for a specific *WorldCat* record. In order to see the underlying MARC format, the researcher must locate the book in a holding library listed among those shown in *WorldCat*, and search the online public catalog (OPAC) of a holding library. Whereas *WorldCat* records are widely available, the availability of library-specific MARC formatted records varies from library to library. When a specific library wishes to make the underlying MARC format available, there will be a link from the library's OPAC display, often identified as an option to click on the MARC record or use the librarian/staff view.

26. When a MARC record is created by the Library of Congress or an OCLC member institution, the date of creation for that record is automatically populated in the fixed field (008), with characters 00 through 05 in year, month, day format (YYMMDD).⁶ Therefore, the MARC record creation date reflects the date on which the publication associated with the record was first cataloged. Thereafter, the local library's computer system may automatically update the date in field 005 every time the library updates the MARC record (*e.g.*, to reflect that an item has

⁶ Some of the newer library catalog systems also include hour, minute, second (HHMMSS).

been moved to a different shelving location within the library, or a reload of the bibliographic data with the introduction of a new library management system that creates and manages the OPAC).

Periodical Publications

27. A periodical publication is a published work in a series, for example, a journal article. A library typically creates a catalog record for a periodical publication when the library receives its first issue. When the institution receives subsequent issues or volumes of the periodical, the issues or volumes are checked in, often using a date stamp; added to the institution's holding records; and made available very soon thereafter, normally within a few days of receipt or at most within a few weeks of receipt.

Cataloging / Indexing

28. A researcher may discover material relevant to a topic of interest in a variety of ways. One common means of discovery is to search for relevant information in an index of periodicals and other publications. Having found relevant material, the researcher will then normally obtain it online, look for it in libraries, or purchase it from a publisher, a bookstore, a document delivery service, or another provider.

29. Indexing services use a wide variety of controlled vocabularies to provide subject access and other means of discovering the content of documents. The formats in which these access terms are presented vary from service to service.

30. Online indexing services commonly provide bibliographic information, abstracts, and full-text copies of the indexed publications, along with a list of the documents cited in the indexed publication. These services also often provide lists of publications that cite a given document. A citation of a document is evidence that the document was publicly available and in use by researchers no later than the publication date of the citing document. A few examples are provided below.

31. **ACS InfoCentral:** provides the latest information for prospective and current subscribers to ACS (American Chemical Society) Publications. *See* <https://pubs.acs.org/page/4librarians/index.html>.

32. **Google Scholar** - This web search engine indexes full text or metadata of scholarly literature, covering numerous formats and disciplines. The size of the database is not published by Google, but researchers have estimated that it contained approximately 160 million items in 2014. *See* Orduña-Malea, Enrique; Ayllón, Juan Manuel; Martín-Martín, Alberto; Delgado López-Cózar, Emilio, “About the size of Google Scholar: playing the numbers” Granada: EC3 Working Papers, 18:23 July 2014, *available at* <https://arxiv.org/ftp/arxiv/papers/1407/1407.6239.pdf>.

33. ***J-STAGE*** - J-STAGE is an electronic journal platform for science and technology information in Japan, developed and managed by the Japan Science and Technology Agency (JST). J-STAGE aims to accelerate the speed of communication and ensure the internationalization of the science and technology information published in Japan. By providing an online publication platform, J-STAGE supports Japanese societies and research organizations, and has published more than 2,000 journals, conference proceedings and other academic publications with high speeds at low costs.

<https://www.jstage.jst.go.jp/static/pages/JstageOverview/-char/en>.

34. **Wiley Online Library** - a full range of unrivaled journals, books, major reference works, and databases. Multidisciplinary collection of online resources covering life, health, and physical sciences; social science; and the humanities—850 scientific and scholarly societies around the world, and access to over 7.5 million articles from over 1,600 journals, over 21,000 online books, and hundreds of multi-volume reference works, databases, and other resources online. See <https://onlinelibrary.wiley.com/researchers>.

35. ***Wisconsin TechSearch (“WTS”)*** - WTS is a set of services offered by the University of Wisconsin Libraries. WTS offers an array of article delivery and research services to any individual or organization who requests the specialized skills of WTS staff in locating and retrieving information, regardless of whether the

individual is affiliated with the University of Wisconsin. See WTS home page, available at <https://wts.wisc.edu/>.

IV. OPINIONS REGARDING AUTHENTICITY AND PUBLIC ACCESSIBILITY OF REFERENCES

Document A: Exhibit 1007. Yamamoto, Kentaro, Yuki Orikasa, Daiko Takamatsu, Yukinori Koyama, Shinichiro Mori, Titus Masese, Takuya Mori, Taketoshi Minato, Hajime Tanida, Tomoya Uruga, Zempachi Ogumi and Yoshiharu Uchimoto, “Stabilization of the Electronic Structure at the Cathode/Electrolyte Interface via MgO Ultra-thin Layer During Lithium-ions Insertion/Extraction” *Electrochemistry/Denki Kagaku*, volume 82, number 10, October, 2014, pages 891-896 (“Yamamoto”).

36. I have been asked to opine on an article, Exhibit 1007, authored by Kentaro Yamamoto, *et al.*, titled “Stabilization of the Electronic Structure at the Cathode/Electrolyte Interface via MgO Ultra-thin Layer During Lithium-ions Insertion/Extraction” published in *Electrochemistry/Denki Kagaku*, volume 82, number 10, July, 2014, on pages 891-896 (“Yamamoto”).

37. In this declaration, Yamamoto will refer to the article, “Stabilization of the Electronic Structure at the Cathode/Electrolyte Interface via MgO Ultra-thin Layer During Lithium-ions Insertion/Extraction” as well as the journal and the specific issue of *Electrochemistry/Denki Kagaku*, depending upon the context in which it is located.

38. I have evaluated the Yamamoto reference several ways: (1) by assessing the digital copy of Yamamoto, Exhibit 1007, provided to me by counsel; (2) by assessing scans of a print copy of Yamamoto owned by the Library of Congress, provided to me at my request by Wisconsin TechSearch (WTS), Attachment A-1; (3) by accessing and reviewing Yamamoto in digital format available to me through the publisher's open access website, Attachment A-2; and (4) by citations to Yamamoto published prior to July 5, 2016, Attachments A-5 and A-6.

Authentication

39. Exhibit 1007, Yamamoto, has been provided to me by counsel. I see no evidence that any alteration or inclusion of pages, etc., were made to Exhibit 1007, Yamamoto. Therefore, I affirm, after once verifying it against Attachment A-1 and Attachment A-2, this is a complete and accurate version of Yamamoto.

40. Attachment A-1 includes scans from the print copy of Yamamoto held by the Library of Congress obtained, at my request, by the Wisconsin TechSearch (WTS) on December 26, 2023.

41. Attachment A-1 includes: bound volume front and back covers and spine with the stamped journal name "*Denki Kagaku*" (transliteration of the journal title in Japanese), and volume number, issue numbers and year, "82, 7-12, 2014," and a stamp that reads "Asian Japan QD 551.D46 Set 1," and barcode with "Library

of Congress,” as shown below, cover of issue – “Vol. 82, No. 10, October 2014”; Table of Contents in Japanese and English; and Yamamoto article on pages 891-896.



42. All identifying characteristics, such stamps and the barcode label on Attachment A-1, are consistent with library practice and procedure that I have observed during my career as a professional librarian, specifically with those items held by the Library of Congress. I have no cause for concern about the authenticity or accuracy of these identifying attributes. In addition, Yamamoto was found within the custody of a library, the Library of Congress, one of the most likely locations for an authentic publication to be located. Evidence of the ownership of Yamamoto by the Library of Congress will further be explored and detailed in the section below on public access.

43. Attachment A-2 is a download of Yamamoto made by me on December 29, 2023 from the open access website provided by *J Stage*, a cooperative digital web platform which provides open access to Japanese journals, such as *Electrochemistry/Denki Kagaku*, as described above. I downloaded Yamamoto, Attachment A-2, at this URL: https://www.jstage.jst.go.jp/article/electrochemistry/82/10/82_14-E00036/_pdf.

44. After comparison between Exhibit 1007, Yamamoto, with Attachment A-1 and the corresponding pages of Attachment A-2, I found no difference between Exhibit 1007, Yamamoto, and Attachment A-1 and Attachment A-2. Therefore, accessing, retrieving and assessing Yamamoto through the Library of Congress, as well as Yamamoto from a reputable research database, I have determined that Exhibit 1007, Yamamoto, is an authentic document.

45. I conclude and affirm that Yamamoto, Exhibit 1007, is an authentic document.

Public Accessibility

46. Attachment A-3 is a true and correct copy of the *WorldCat* entry for Yamamoto (*Electrochemistry*). I obtained Attachment A-3 by completing a search on *WorldCat* on December 29, 2023 by searching District of Columbia (Library of Congress).

47. Attachment A-3 shows that Yamamoto is the document associated with this *WorldCat* entry, as verified by title: *Electrochemistry* and *Denki Kagaku*; and ISSN: 1344-3542.

48. Yamamoto could have been located in *WorldCat* by searching for the title: *Electrochemistry* and/or *Denki Kagaku*; and/or subject headings: *Chemical engineering*; *Chemical engineering Japan Periodicals*; *Chemistry, Physical and theoretical*; *Electrochemistry*; and *Electrochemistry, Industrial* among others.

49. When I searched *WorldCat* for holdings of Yamamoto in the District of Columbia, the Library of Congress was first on the list among the 231 libraries shown as holding Yamamoto worldwide.

50. The search discussed above could have been performed anywhere in the world by anyone who could access *WorldCat* through July 2016.

51. Attachment A-4 is a download I made from the Library of Congress OPAC (online catalog) on December 26, 2023. The document cataloged in this record is Yamamoto as verified by the OPAC record fields including title: *Denki Kagaku and Electrochemistry* (as described in variant title); and ISSN: 1344-3542.

52. The record of holdings of *Denki Kagaku and Electrochemistry* by the Library of Congress is shown in the line titled: “Item Availability,” as show below in older receipts. I compared the Library of Congress Classification (call number): QD551.D46 with that shown on the spine of the bound volume in Attachment A-1

and it is the same on both with the exception of “Set1,” which is a shelving locator and is not included in the OPAC call number.

Asian Reading Room (Jefferson, LJ150)
Status Not Charged
Older receipts v.29:no.6-v.31:no.6 (1961:June-1963:June), v.31:no.8-v.36:no.9
(1963:Aug.-1968:Sept.), v.36:no.11-v.71:no.4 (1968:Nov.-2003:Apr.),
v.71:no.6-v.85:no.12 (2003:June-2017:Dec.)

53. Yamamoto could have been located in the Library of Congress OPAC by searching for the title: *Electrochemistry/Denki Kagaku*; or by searching the subject headings: *Chemical engineering*; *Chemistry, Physical and theoretical*; *Electrochemistry*; and *Electrochemistry, Industrial* among others.

54. The Library of Congress curtailed date stamping journal issues when received in the early 2000’s. Therefore, there is no date available when the Library of Congress received *Electrochemistry/Denki Kagaku*, volume 82, number 10, October, 2014. However, there are ways to determine when Yamamoto would have been publicly accessible.

55. On Attachment A-1 in the upper right hand corner there are several dates that read: “Received: April 15, 2014; Accepted: July 26, 2014; Published: October 5, 2014,” as shown below:

Received: April 15, 2014
Accepted: July 26, 2014
Published: October 5, 2014

56. The date, October 5, 2014, when it was published on-line is, more likely than not, close to the date when the print issue would have been received at the Library of Congress. Therefore, accounting for processing time of a week to ten days, more likely than not, Yamamoto would have been available in print at the Library of Congress on October 15, 2014.

57. Once Yamamoto was in the collection of the Library of Congress, members of the public could access Yamamoto by having it brought to either the Jefferson or Adams Reading Rooms. Accordingly, a copy of Yamamoto was accessible to the general public when it was available at the Library of Congress.

58. A search on *Google Search* after October 5, 2014, when Yamamoto was issued digitally, would have connected the researcher to the *J Stage* database from which he/she could access Yamamoto.

59. Evidence of public access to a research article is a citation in a published article, thereby documenting both authenticity and public access as of the date of publication of the citing article.

60. Attachment A-5 is an article by Yuri Orikasa titled: “Hierarchical Spatiotemporal Analyses of Reactions Using Synchrotron Radiation and the Design of Next-Generation Energy Conversion Devices” published in *Electrochemistry/Denki Kagaku*, volume 83, number 9, in 2015 on pages 695-700 (“Orikasa”).

61. Orikasa is made available through the *J-Stage* database at an open access URL: https://www.jstage.jst.go.jp/article/electrochemistry/83/9/83_15-5-E2644/_pdf/-char/ja.

On page 700 in the list of “References,” number 15 reads:

15. K. Yamamoto, Y. Orikasa, D. Takamatsu, Y. Koyama, S. Mori, T. Masese, T. Mori, T. Minato, H. Tanida, T. Uruga, Z. Ogumi, and Y. Uchimoto, *Electrochemistry*, 82, 891 (2014).

62. Since Yamamoto was cited in an article by Y. Orikasa, in *Electrochemistry*, volume 83, number 9, in 2015, Yamamoto is an authentic document and was publicly accessible as of 2015.

63. Attachment A-6 is an article by Takamatsu, Daiko, Yuki Orikasa, Shinichiro Mori, Takayuki Nakatsutsumi, Kentaro Yamamoto, Yukinori Koyama, Taketoshi Minato *et al.*, titled: “Effect of An Electrolyte Additive of Vinylene Carbonate on the Electronic Structure at the Surface of a Lithium Cobalt Oxide Electrode under Battery Operating Conditions” published in *The Journal of Physical Chemistry*, volume 119, number 18, May 7, 2015 on pages 9791-9797 (“Takamatsu”).

64. Takamatsu was accessible to me through my emeritus faculty status at Purdue University at this URL maintained by the American Chemical Society: <https://pubs.acs.org/doi/epdf/10.1021/jp511405g>. Takamatsu is available for a fee at URL: <https://pubs.acs.org/doi/epdf/10.1021/jp511405g>.

65. On page 2796 in the list of “References,” number 26 reads:

(26) Yamamoto, K.; Orikasa, Y.; Takamatsu, D.; Koyama, Y.; Mori, S.; Masese, T.; Mori, T.; Minato, T.; Tanida, H.; Uruga, T.; et al. Stabilization of the Electronic Structure at the Cathode/Electrolyte Interface via MgO Ultra-Thin Layer during Lithium-Ions Insertion/Extraction. *Electrochemistry* **2014**, 82, 891-896.

66. Since Yamamoto was cited in an article by Daiko Takamatsu in *The Journal of Physical Chemistry* (a publication of the American Chemical Society), volume 119, number 8, May 7, 2015, Yamamoto is an authentic document and was publicly accessible as of May 7, 2015.

Conclusion

67. Therefore, I opine that Yamamoto, Exhibit 1007, is an authentic document and would have been publicly accessible prior to July 5, 2016.

Document B. Exhibit 1009. Kim, Hyejung, Min Gyu Kim, Hu Young Jeong, Haisol Nam, and Jaephil Cho. “A New Coating Method for Alleviating Surface Degradation of $\text{LiNi}_{0.6}\text{Co}_{0.2}\text{Mn}_{0.2}\text{O}_2$ Cathode Material: Nanoscale Surface Treatment of Primary Particles” *Nano Letters*, volume 15, number 3, March, 2015, pages 2111-2119 (“Kim”).

68. I have been asked to opine on the authenticity and public access of an article, Exhibit 1009, authored by Hyejung Kim, Min Gyu Kim, Hu Young Jeong, Haisol Nam, and Jaephil Cho. “A New Coating Method for Alleviating Surface Degradation of $\text{LiNi}_{0.6}\text{Co}_{0.2}\text{Mn}_{0.2}\text{O}_2$ Cathode Material: Nanoscale Surface Treatment

of Primary Particles” published in *Nano Letters*, volume 15, number 3, March, 2015, pages 2111-2119 (“Kim”).

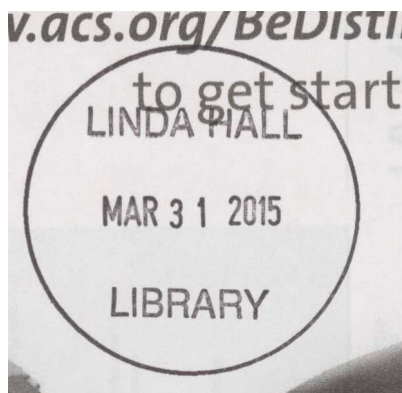
69. For consistency and clarification, Kim, when used in this declaration, refers not only to the Kim article but also the *Nano Letters* issue in which it was published: volume 15, number 3, March, 2015, dependent on context.

Authentication

70. I have evaluated the Kim reference in three ways: (1) by assessing Exhibit 1009, provided to me by counsel; (2) by requesting and assessing scans of Kim from the Linda Hall Library provided to me at my request through its Document Delivery Services on December 27, 2023, appended to this declaration as Attachment B-1⁷; (3) by retrieving and reviewing a download of Kim I made from *ACS Publications*, a proprietary database provided by the American Chemical Society on December 30, 2023, through Purdue University Libraries, Attachment B-2; and (4) by citations to Kim published prior to July 5, 2016, Attachments B-7 and B-8.

⁷ The Linda Hall Library, located in Kansas City, Missouri, is a pre-eminent research library in the areas of science, engineering and technology.

71. Attachment B-1 is a scan of Kim received from the Linda Hall Library that includes: *Nano Letters* cover for the March 2015 issue, volume 15, number 1; ACS promotion page with a stamp that reads, “LINDA HALL LIBRARY, MAR 31, 2015”; and the Kim article on pages 2111-2119.



72. All identifying characteristics on Attachment B-1, date and stamp, are consistent with library practice and procedure that I have observed during my career as a professional librarian, specifically with those I have seen over the last five years with items held by the Linda Hall Library. I have no cause for concern about the authenticity or accuracy of these identifying attributes. Attachment B-1 was found within the custody of a library, the Linda Hall Library, one of the most likely locations for an authentic publication.

73. Kim is available on-line through the *ACS Publications* database. I downloaded Attachment B-2 from *ACS Publications* through Purdue University Libraries by my emeritus faculty position at the URL:

<https://pubs.acs.org/doi/epdf/10.1021/acs.nanolett.5b00045>. Kim is available for a fee at URL: <https://pubs.acs.org/doi/epdf/10.1021/acs.nanolett.5b00045>.

74. I have compared Attachment B-1 and Attachment B-2 and have found no difference between the two. Additionally, I have compared Attachment B-1 and Attachment B-2 with Exhibit 1009, provided to me by counsel, and have found no differences among the three. Given the above, I conclude that Kim, Exhibit 1009, Attachment B-1, and Attachment B-2 contains an authentic, true, and correct copy of Kim.

Public Accessibility

75. Attachment B-3 is a true and correct copy of the *WorldCat* entry for Kim, *Nano Letters* in print. I obtained Attachment B-3 by completing a search on *WorldCat* on December 30, 2023. The document indexed in this record is Kim as verified by title: *Nano Letters*; publisher: American Chemical Society; and ISSN: 1530-6984.

76. Attachment B-4 is a true and correct copy of the *WorldCat* entry for Kim, *Nano Letters* electronic (online). I obtained Attachment B-4 by completing a search on *WorldCat* on December 30, 2023. The document indexed in this record is Kim as verified by title: *Nano Letters*; publisher: American Chemical Society; and ISSN: 1530-6992.

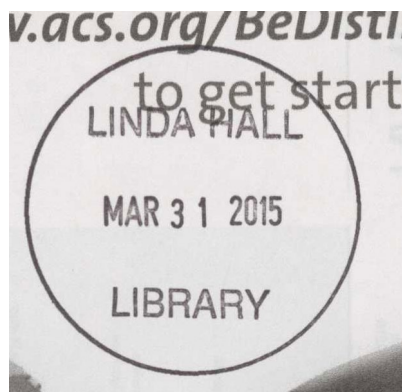
77. When undertaking the search on *WorldCat* as described above using the geographical location of Missouri, the Linda Hall Library was fourth on the list among the 712 libraries that hold Kim, *Nano Letters* world-wide, whether in print or in electronic format (online).

78. Exhibit 1009, Kim (Nano Letters) could have been located in *WorldCat* by title: *Nano Letters*; or by subject headings: *Biotechnology*; *Microelectronics*; *Miniaturization*; *Molecular Biology*; and *Nanotechnology*, among others.

79. Attachment B-6 is a download I made from the Linda Hall Library OPAC (online catalog) on December 30, 2023. The document cataloged in this record is Kim as verified by title: *Nano Letters*; publisher: American Chemical Society; and ISSN: 1530-6984.

80. Exhibit 1009, Kim (Nano Letters) could have been located and accessible in print version in the Linda Hall Library OPAC by searching for title: *Nano Letters*; or subject heading: *Nanotechnology*. In addition, Kim could have been located while in the Linda Hall Library which would have provided access on site to the Nano Hub in electronic format, by searching for author: Hyejung Kim; title: “A New Coating Method for Alleviating Surface Degradation of $\text{LiNi}_{0.6}\text{Co}_{0.2}\text{Mn}_{0.2}\text{O}_2$ Cathode Material: Nanoscale Surface Treatment of Primary Particles”; and/or subject heading, more likely than not: *Nanotechnology*.

81. Evidence that the Linda Hall Library owns and received Kim, *Nano Letters*, March 2015 issue is evidenced on Attachment B-1 where the date stamp of receipt by the Linda Hall Library on March 31, 2015 is detailed, as shown below:



82. Consistent with standard library policy and practice, Kim, *Nano Letters*, March 2015, would have been accessible on the shelf in the Linda Hall Library within a week to ten days after check-in, labeling, and transfer to the shelf, that is, no later than April 10, 2015.

83. Evidence that Kim was publicly accessible is further confirmed by articles that cite Kim prior to July 5, 2016.

84. Attachment B-7 is an article by Jinhyuk Lee, Dong-Hwa Seo, Mahalingam Balasubramanian, Nancy Twu, Xin Li, and Gerbrand Ceder titled "A New Class of High Capacity Cation-disordered Oxides for Rechargeable Lithium Batteries: Li–Ni–Ti–Mo Oxides" published in *Energy & Environmental Science*, volume 8, number 11, November 2015, pages 3255-3265.

85. Attachment B-7 was downloaded by me on December 30, 2023, enabled by my emeritus faculty position at Purdue University, through the Purdue University Libraries at URL: <https://pubs-rsc-org.ezproxy.lib.purdue.edu/en/content/articlepdf/2015/ee/c5ee02329g>.

Lee is available for a fee at URL:

<https://pubs.rsc.org/en/content/articlelanding/2015/ee/c5ee02329g>.

86. On page 3265 in ‘References,’ number 56 is a citation to Kim, as shown below:

56 H. Kim, M. G. Kim, H. Y. Jeong, H. Nam and J. Cho, *Nano Lett.*, 2015, 15, 2111–2119

87. The citation to Kim in Lee is evidence that Kim was known and accepted as a scholarly reference when Lee was published in *Energy & Environmental Science* in its November 2015 issue, volume 8, number 11, pages 3255-3265.

88. Attachment B-8 is an article by William E. Gent, Yiyang Li, Sungjin Ahn, Jongwoo Lim, Yijin Liu, Anna M. Wise, Chirranjeevi Balaji Gopal *et al.* “Persistent State-of-Charge Heterogeneity in Relaxed, Partially Charged $\text{Li}_{1-x}\text{Ni}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$ Secondary Particles” published in *Advanced Materials*, volume 28, number 31, published May 17, 2016, pages 6631-6638 (“Gent”).

89. Attachment B-8 was downloaded by me on December 30, 2023, enabled by my emeritus faculty position at Purdue University, through the Purdue

University Libraries at URL: <https://onlinelibrary-wiley-com.ezproxy.lib.purdue.edu/doi/epdf/10.1002/adma.201601273>.

Gent is available for a fee at URL:

<https://onlinelibrary.wiley.com/doi/epdf/10.1002/adma.201601273>.

90. On page 6637 in [References], number 18 is a citation to Kim, as shown below:

[18] H. Kim, M.-G. Kim, H. Y. Jeong, H. Nam, J. Cho, *Nano Lett.* **2015**, 15, 2111.

91. The citation to Kim in Gent is evidence that Kim was known and accepted as a scholarly reference when Lee was published May 17, 2016.

92. The combined evidence of the print copy received on March 15, 2015 and held by the Linda Hall Library documents Kim's, Exhibit 1009, authenticity and public accessibility ten days after receipt, March 25, 2015.

93. In addition to the evidence provided above, the two citations to Kim, Lee and Gent, support that Kim was considered authentic and authoritative and was publicly accessible allowing it to be cited in articles published prior to July 5, 2016.

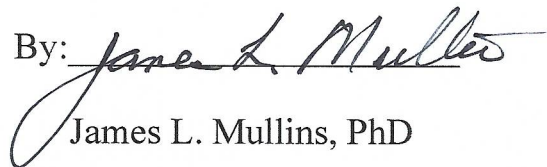
94. Therefore, I opine that Kim, Exhibit 1009, submitted in this proceeding as Exhibit 1009, is an authentic document that was publicly accessible prior to July 5, 2016.

VI. RIGHT TO SUPPLEMENT

95. I reserve the right to supplement my opinions in the future to respond to any arguments that Patent Owner or its expert(s) or counsel may raise, and to take into account new information as it becomes available to me.

96. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed on: January 10, 2024

By: 
James L. Mullins, PhD