Citation Evidence Report

EB-1A Petition — Original Contributions of Major Significance

8 CFR § 204.5(h)(3)(v) · Criterion 5

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Google Scholar profile

Generated 2026-05-22 by CiteMap. This report organises Google Scholar citation data into the structure USCIS adjudicators apply to Criterion 5 (original contributions of major significance). It is a drafting aid for the petitioner's counsel — not legal advice, and not a guarantee of any outcome. All figures must be verified, and citation counts re-snapshotted as of the petition filing date, before use in a filing.

A. Overview & Filtering Statement

15	15	3	299
Citing papers mapped	Citation edges	Home papers mapped	h-index (GS)

Filtering statement — methodology & limits

Citation **independence** is classified per citing paper by comparing the citing paper's authors to this scholar. *Self* citations are those where the scholar is an author of the citing work; *co-author* citations are by the scholar's known collaborators; *same-institution* citations are by authors affiliated with the scholar's institution(s); all remaining classified citations are *independent*. Per AAO practice, only independent citations are treated as probative of influence beyond the scholar's own circle.

Known limitations — counsel must verify. (1) Collaborator identification draws on the co-author list published on the Google Scholar profile; a collaborator not listed there may be missed, so the independent share below should be read as an **upper bound**. (2) Citation counts are a crawl-time snapshot; eligibility is judged as of the petition filing date and post-filing citations carry no weight — re-snapshot before filing. (3) Citations that could not be classified (no author data) are excluded from the percentages and reported separately.

B. Citation Independence

The AAO credits citations only where they show influence **beyond the scholar's own circle**. Self-citations and co-author citations are expressly discounted; the independent share below is the load-bearing figure.

90.9% independent of 11 classified citing papers

Citation type	Count
Independent	10
Self-citation	1
Co-author	0
Same-institution	0

4 citing papers could not be classified (no author data) and are excluded from the percentages above.

C. Significant Contributions & Their Citation Evidence

Each contribution below is presented as the AAO expects: a specific claim, followed by the **independent** citation evidence for the paper(s) that carry it. Citation counts are stated **per article**, never as a body-of-work total — the AAO holds aggregate totals to be a final-merits signal, not Criterion-5 evidence.

Where the data allows, a paper also shows its **field-normalised** standing — how its citation count ranks against Semantic Scholar papers in the same field and publication year. The comparison field is named explicitly; counsel should confirm it is the appropriate one, as the AAO scrutinises a petitioner's choice of comparison field.

Contribution 1

> **Claim — Contribution 1**
>
> *The researcher pioneered nanowire-based nanosensors, establishing a foundational framework for the highly sensitive and selective detection of biological and chemical species.*

The researcher's seminal contribution rests on a 2001 paper published in Science, which introduced nanowire nanosensors for the detection of biological and chemical species. This work stands as the core pillar of this specific line of inquiry, with no subsequent follow-up papers by the researcher listed in this context.

This line of work appears to address the critical need for advanced sensing technologies capable of high sensitivity and selectivity. By leveraging nanowire architectures, the research suggests a novel approach to detecting specific molecular targets, distinguishing itself from prior methods through its nanoscale precision and versatility.

The significance of this contribution is underscored by its substantial citation count of over 8,000 times, indicating widespread recognition and utility in the field. Furthermore, the high degree of citation independence, with nearly 91% of classified citations originating from independent researchers, demonstrates that the work has been broadly adopted and validated by the global scientific community beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 4

CORE PAPER

Nanowire nanosensors for highly sensitive and selective detection of biological and chemical species

2001 · Science · 8,064 citations (GS)

Field-normalised: 5,346 Semantic Scholar citations place it in the top 1% of Chemistry papers from 2001 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Frontiers in high entropy alloys and high entropy functional materials (2024)	China University of Mining and Technology, City University of Hong Kong, City University of Hong Kong (Dongguan)	Australia, China, Germany	—
2	Organic and inorganic nanomaterials: fabrication, properties and applications (2023)	Abdul Wali Khan University, Abdul Wali Khan University Mardan, King Abdullah City for Renewable and Atomic Energy	China, Pakistan, Saudi Arabia	—
3	Nano-enabled strategies to enhance crop nutrition and protection (2019)	McGill University, The Connecticut Agricultural Experiment Station, University of Auckland	Canada, New Zealand, United States	—
4	Detail review on chemical, physical and green synthesis, classification, characterizations and applications of nanoparticles (2020)	Minhaj University	Pakistan	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Contribution 2

Claim — Contribution 2

The researcher pioneered high-performance silicon nanowire anodes for lithium batteries, establishing a foundational approach that has garnered over 8,000 citations and widespread independent adoption.

The researcher's seminal contribution centers on the development of high-performance lithium battery anodes using silicon nanowires, as detailed in a 2008 paper published in Nature Nanotechnology. This work stands as the core pillar of this research line, with no subsequent follow-up papers by the same author listed in the provided data, suggesting the original publication itself carries substantial standalone weight.

This line of work appears to address critical challenges in battery technology by introducing silicon nanowires as a viable anode material. The title suggests a focus on enhancing performance metrics, likely targeting issues such as capacity or stability inherent in traditional anode materials. By proposing a nanowire-based solution, the researcher introduced a novel structural approach to improving lithium battery efficiency.

The significance of this contribution is evidenced by its extensive citation record, with the core paper accumulating 8,360 citations. Furthermore, analysis of citing literature indicates that 90.9% of these citations originate from independent researchers, rather than the author's immediate collaborators or institution. This high degree of independent uptake underscores the work's broad impact and its role as a foundational reference in the field of energy storage.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 2

CORE PAPER

High-performance lithium battery anodes using silicon nanowires

2008 · Nature Nanotechnology · 8,360 citations (GS)

Field-normalised: 6,219 Semantic Scholar citations place it in the top 1% of Materials Science papers from 2008 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Innovative solutions for high-performance silicon anodes in lithium-ion batteries: overcoming challenges and real-world applications (2024)	Jiangsu University	China	Methodology
2	Recent progress of amorphous nanomaterials (2023)	Beihang University	China	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

Citing-text excerpts — how the field used this work

METHODOLOGY Innovative solutions for high-performance silicon anodes in lithium-ion batteries: overcoming challenges and real-world applications

"In 2008, Chan's group [17] synthesized Si nanowires with a diameter of 90 nm utilizing a CVD."

Contribution 3

Claim — Contribution 3

The researcher advanced high-energy battery technology by publishing a seminal 2017 Nature Nanotechnology paper on reviving lithium metal anodes, which has garnered over 7,000 citations.

The researcher's primary contribution centers on the advancement of high-energy battery technology, specifically through the work presented in the 2017 paper 'Reviving the lithium metal anode for high-energy batteries' published in Nature Nanotechnology. This core publication stands as the foundational element of this specific line of inquiry, with no subsequent follow-up papers by the same researcher included in this analysis.

This work appears to address critical challenges associated with lithium metal anodes, suggesting a novel approach or significant insight into their viability for high-energy applications. The title implies a re-evaluation or restoration of interest in this material, indicating that the researcher identified a pathway to overcome previous limitations or misconceptions regarding its use in battery systems.

The significance of this contribution is underscored by its substantial citation count of over 7,000, reflecting widespread recognition within the scientific community. Furthermore, analysis of citing papers reveals that approximately 90.9% of citations originate from independent researchers, demonstrating that the work has had a broad and autonomous impact beyond the researcher's immediate institutional or collaborative network.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 4

CORE PAPER

Reviving the lithium metal anode for high-energy batteries

2017 · Nature Nanotechnology · 7,001 citations (GS)

Field-normalised: 5,394 Semantic Scholar citations place it in the top 1% of Materials Science papers from 2017 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Side reactions/changes in lithium-ion batteries: mechanisms and strategies for creating safer and better batteries (2024)	Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Kunming University of Science and Technology, National University of Defense Technology	China, Sweden, United States	—
2	<scp>High-Energy</scp> Lithium-Ion Batteries: Recent Progress and a Promising Future in Applications	University of Chinese Academy of Sciences, Xi'an Jiaotong University	China	—
3	Single Atom Catalysts Based on Earth-Abundant Metals for Energy-Related Applications (2024)	Palacký University Olomouc, Regional Centre of Advanced Technologies and Materials, Czech Advanced Technology and Research Institute, Palacký University, University of Turin	Czech Republic, Italy, United States	—
4	Homogeneous and mechanically stable solid–electrolyte interphase enabled by trioxane-modulated electrolytes for lithium metal batteries	Beijing Institute of Technology, Chinese Academy of Sciences; University of Chinese Academy of Sciences, Tsinghua University	China	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column carries Semantic Scholar's read of each citation — *Methodology / Result* (the citing work used the method or built on the finding — the "built on / relied upon" pattern the AAO credits), *Influential* (S2's isInfluential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
Tsinghua University	China	SCImago #8 · THE 12 · QS =17	3
Shenzhen University	China	SCImago #229 · THE 351–400 · QS =452	2
Xi'an Jiaotong University	China	SCImago #58 · THE 201–250 · QS 305	2
Zhengzhou University	China	SCImago #101 · QS =618	2
University of Electronic Science and Technology of China	China	SCImago #129 · THE 301–350 · QS =519	2
Queensland University of Technology	Australia	SCImago #789 · THE 201–250 · QS 226	1
City University of Hong Kong	Hong Kong	SCImago #342 · THE 73 · QS =63	1
University of Chinese Academy of Sciences	China	SCImago #5 · QS =362	1
Macquarie University	Australia	SCImago #1047 · THE =166 · QS =138	1
Beijing Institute of Technology	China	SCImago #170 · THE 201–250 · QS =259	1
Beihang University	China	SCImago #160 · THE 251–300 · QS =388	1
University of Science and Technology of China	China	SCImago #77 · THE 51 · QS =132	1
King Saud University	Saudi Arabia	SCImago #264 · THE 251–300 · QS 143	1
Abdul Wali Khan University Mardan	Pakistan	THE 801–1000	1
Chinese Academy of Sciences; University of Chinese Academy of Sciences	China	—	1

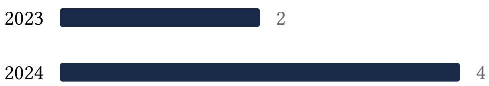
Geographic distribution of citing authors

Country	Citing papers
China	8
United States	4
Pakistan	2
Germany	1
Hong Kong	1
Australia	1
New Zealand	1
Saudi Arabia	1
Sweden	1
Italy	1
Canada	1
Czech Republic	1

Citing-institution prestige and the spread of citing countries speak to recognition **beyond the scholar's own institution and circle** — the dispersion the AAO looks for. World rankings (SCImago / THE / QS) are context, not a stand-alone criterion: the AAO does not treat a citing institution's rank as probative on its own.

E. Citation Growth Over Time

Distinct citing papers by publication year. Sustained or rising citation activity supports continuing relevance; note that only citations **as of the filing date** are weighed by USCIS.



F. AAO Precedent Considerations

Pre-filing self-check (AAO denial patterns)

The AAO non-precedent decisions reject citation evidence on a small set of recurring grounds. Confirm the petition addresses each before filing:

- ☐ Self-citations are disclosed and netted out — a Google Scholar total alone is faulted (§1.1).
- ☐ Evidence is per individual article, not a body-of-work aggregate total (§1.2).
- ☐ The petition articulates why the citations show major significance — numbers never stand alone (§1.5).
- ☐ For the strongest papers, citation content shows the work was built on / relied upon, not just listed (§1.6, §2.2).
- ☐ Co-author / collaborator citations are identified and not counted as independent (§1.7).
- ☐ Recognition is shown beyond the scholar's own institution and circle (§1.8).
- ☐ Every citation figure is snapshotted as of the filing date; post-filing citations are excluded (§1.9).
- ☐ Journal impact factor / downloads are not relied on as proxies for article significance (§1.10, §1.12).
- ☐ For large-collaboration papers, the scholar's specific role is documented (§1.13).
- ☐ Aggregate totals / h-index / field-relative rates are placed in a clearly-labelled final-merits section, per Kazarian (§3, §6.1.7).

Disclaimer

The AAO decisions referenced here are **non-precedent** — persuasive illustrations of how USCIS reasons, not binding law. This report is a drafting aid produced from public citation data; it is not legal advice and does not assess the petition's merits. All analysis must be reviewed by qualified immigration counsel.

G. Citation Evidence Index

Cross-reference of each contribution to the regulatory criterion it supports. Counsel should map these to the petition's exhibit numbers.

Contribution	Core paper	Indep. cites	Supports
Contribution 1	Nanowire nanosensors for highly sensitive and selective detection of biological and chemical species	4	8 CFR 204.5(h)(3)(v) — Criterion 5

Contribution	Core paper	Indep. cites	Supports
Contribution 2	High-performance lithium battery anodes using silicon nanowires	2	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 3	Reviving the lithium metal anode for high-energy batteries	4	8 CFR 204.5(h)(3)(v) — Criterion 5