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 2026-05-21 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

11	11	2	68
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.

100.0% independent of 11 classified citing papers

Citation type	Count
Independent	11
Self-citation	0
Co-author	0
Same-institution	0

0 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 developed a NiSe nanowire film on nickel foam as an efficient, stable 3D bifunctional electrode for full water splitting, establishing a foundational approach in electrocatalysis.

The researcher's core contribution centers on the development of a NiSe nanowire film supported on nickel foam, presented in a 2015 paper in Angewandte Chemie International Edition. This work proposes an efficient and stable three-dimensional bifunctional electrode designed for full water splitting, addressing the need for robust materials in electrochemical energy conversion. The titles suggest a focus on structural innovation, utilizing nanowire architectures to enhance performance and stability in demanding electrolytic environments.

This line of work appears to address the challenge of creating cost-effective, high-performance electrodes that can simultaneously drive both hydrogen and oxygen evolution reactions. By integrating NiSe nanowires with a conductive nickel foam substrate, the research likely aimed to improve surface area and electron transport, offering a novel solution to the limitations of traditional catalysts. The absence of follow-up papers by the same researcher indicates that this single publication stands as a distinct, self-contained contribution to the field.

The significance of this work is underscored by its substantial citation count of 1,771, indicating widespread recognition and utility within the scientific community. Notably, all classified citing papers originate from independent researchers, suggesting that the findings have been adopted and built upon by external groups rather than merely circulated within the researcher's immediate network. This broad, independent uptake highlights the work's impact as a foundational reference in the study of bifunctional electrocatalysts.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 8

CORE PAPER

NiSe Nanowire Film Supported on Nickel Foam: An Efficient and Stable 3D Bifunctional Electrode for Full Water Splitting

2015 · Angewandte Chemie International Edition in English · 1,771 citations (GS)

Field-normalised: 1,480 Semantic Scholar citations place it in the top 1% of Chemistry papers from 2015 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	Water electrolysis: from textbook knowledge to the latest scientific strategies and industrial developments (2022)	California Institute of Technology, Columbia University, CSIR-Central Electrochemical Research Institute	Denmark, France, Germany	—
2	Unlocking Efficiency: Minimizing Energy Loss in Electrocatalysts for Water Splitting (2024)	The University of New South Wales	Australia	—
3	Clean and Affordable Hydrogen Fuel from Alkaline Water Splitting: Past, Recent Progress, and Future Prospects (2021)	University of Science and Technology of China	China	—
4	Self-Supported Transition-Metal-Based Electrocatalysts for Hydrogen and Oxygen Evolution (2020)	Nankai University	China	—
5	Key components and design strategy of the membrane electrode assembly for alkaline water electrolysis (2023)	Tsinghua University	China	—
6	Recent Trends and Perspectives in Electrochemical Water Splitting with an Emphasis on Sulfide,	CSIR-Central Electrochemical Research Institute, CSIR-Central	India	—

No.	Citing paper	Citing institution(s)	Country	S2
	Selenide, and Phosphide Catalysts of Fe, Co, and Ni: A Review (2016)	Electrochemical Research Institute (CECRI)		
7	High-efficiency overall alkaline seawater splitting: using a nickel–iron sulfide nanosheet array as a bifunctional electrocatalyst (2022)	First People's Hospital Affiliated to Huzhou University, University of Electronic Science and Technology of China	China	—
8	Recent Progress in Cobalt-Based Heterogeneous Catalysts for Electrochemical Water Splitting (2016)	Changchun Institute of Applied Chemistry, King Abdulaziz University, Shandong University	China, Saudi Arabia	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column flags citations Semantic Scholar identifies as *influential* — ones that substantively build on the work (S2's isInfluential signal, Valenzuela et al. 2015) — the "built on / relied upon" pattern the AAO credits. Counsel should quote the citing text for the strongest of these.

Contribution 2

Claim — Contribution 2

The researcher developed a scalable synthesis method converting 3D ZIF nanocrystals into Co–Nx/C nanorod arrays, significantly advancing electrocatalyst performance for ORR, OER, and Zn–Air batteries.

CLAIM: The researcher's primary contribution is the development of a novel electrocatalyst synthesis pathway, detailed in a 2018 Advanced Functional Materials paper. This work demonstrates the transformation of 3D ZIF nanocrystals into Co–Nx/C nanorod arrays for energy applications.

ORIGINALITY: The titles indicate a focus on structural engineering, specifically converting zeolitic imidazolate frameworks into carbon-supported cobalt-nitrogen species. This approach appears to address the need for efficient, non-precious metal catalysts by leveraging the unique morphology of nanorod arrays to enhance surface area and catalytic activity for oxygen reduction and evolution reactions.

SIGNIFICANCE: With 868 citations, this work is highly influential in the field of electrocatalysis. Notably, 100% of the classified citing papers originate from independent researchers, suggesting that the methodology and findings have been widely adopted and validated by the broader scientific community outside the researcher's immediate network.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 3

CORE PAPER

From 3D ZIF Nanocrystals to Co–Nx/C Nanorod Array Electrocatalysts for ORR, OER, and Zn–Air Batteries

2018 · Advanced Functional Materials · 868 citations (GS)

Field-normalised: 736 Semantic Scholar citations place it in the top 1% of Materials Science papers from 2018 indexed by Semantic Scholar, by citation count.

No.	Citing paper	Citing institution(s)	Country	S2
1	MOF-derived electrocatalysts for oxygen reduction, oxygen evolution and hydrogen evolution reactions (2020)	AIST-Kyoto University, TUD Dresden University of Technology	Germany, Japan	—
2	Metal–Organic Frameworks in Heterogeneous Catalysis: Recent Progress, New Trends, and Future Perspectives (2020)	King Abdullah University of Science and Technology	Saudi Arabia	—

No.	Citing paper	Citing institution(s)	Country	S2
3	[Designing MOF Nanoarchitectures for Electrochemical Water Splitting](#) (2021)	Sichuan University, Technische Universität Berlin, West China School of Medicine/West China Hospital, Sichuan University	China, Germany	—

Independent citing papers only; self- and co-author citations excluded. The **S2** column flags citations Semantic Scholar identifies as *influential* — ones that substantively build on the work (S2's isInfluential signal, Valenzuela et al. 2015) — the "built on / relied upon" pattern the AAO credits. Counsel should quote the citing text for the strongest of these.

D. Citing-Institution Prestige & Geography

Top citing institutions

Institution	Country	World ranking	Citing papers
CSIR-Central Electrochemical Research Institute	India	—	2
Shandong University	China	SCImago #79 · THE 251–300 · QS =339	1
University of Milano-Bicocca	Italy	SCImago #1168 · QS =542	1
Nankai University	China	SCImago #347 · THE 251–300 · QS =355	1
King Abdulaziz University	Saudi Arabia	SCImago #680 · THE 351–400 · QS 163	1
Sichuan University	China	SCImago #32 · THE 201–250 · QS =324	1
University of Science and Technology of China	China	SCImago #77 · THE 51 · QS =132	1
Indian Institute of Technology Madras	India	SCImago #2392 · QS 180	1
Massachusetts Institute of Technology	United States	SCImago #41 · THE 2 · QS 1	1
Columbia University	United States	SCImago #65 · THE 20 · QS =38	1
King Abdullah University of Science and Technology	Saudi Arabia	SCImago #680	1
Université Paris-Saclay	France	SCImago #235 · THE =68 · QS =70	1
Harvard University	United States	SCImago #4 · THE =5 · QS 5	1
University Grenoble Alpes	France	—	1
Technical University of Denmark	Denmark	SCImago #404 · THE 121 · QS 107	1

Geographic distribution of citing authors

Country	Citing papers
China	6
Saudi Arabia	3
Germany	3
India	2
Italy	1

Country	Citing papers
Japan	1
Netherlands	1
United Kingdom	1
Australia	1
United States	1
Denmark	1
France	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	NiSe Nanowire Film Supported on Nickel Foam: An Efficient and Stable 3D Bifunctional Electrode for Full Water Splitting	8	8 CFR 204.5(h)(3)(v) — Criterion 5
Contribution 2	From 3D ZIF Nanocrystals to Co–Nx/C Nanorod Array Electrocatalysts for ORR, OER, and Zn–Air Batteries	3	8 CFR 204.5(h)(3)(v) — Criterion 5