

Citation Evidence Report

EB-1A Petition — Original Contributions of Major Significance

8 CFR § 204.5(h)(3)(v) · Criterion 5

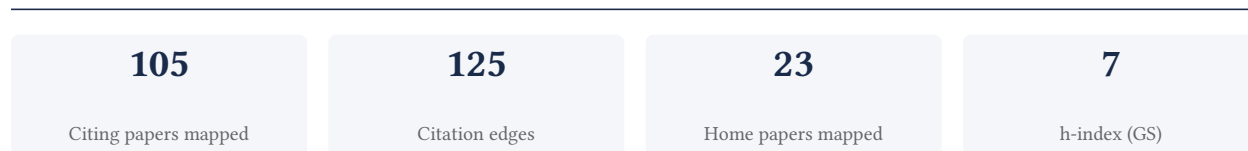
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[Google Scholar profile](#)

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



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.

74.1% independent of 27 classified citing papers

| Citation type | Count |
|------------------|-------|
| Independent | 20 |
| Self-citation | 3 |
| Co-author | 4 |
| Same-institution | 0 |

78 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 advanced magnetic hyperthermia efficiency by systematically investigating magnetic anisotropy in cobalt-substituted iron oxide nanoparticles and extending these principles to rare-earth doped and annealed nanomaterials.

The researcher established a foundational contribution to magnetic hyperthermia through the 2021 core paper examining the role of magnetic anisotropy in spherical Fe_{3-x}Co_xO₄ nanoparticles. This work serves as the anchor for a coherent research line focused on optimizing magnetic properties for thermal therapy applications.

This line of work appears to address the critical need for precise control over magnetic parameters to enhance hyperthermia efficiency. By progressing from cobalt substitution in 2021 to rare-earth doping in 2022 and annealing effects in 2023, the researcher demonstrates a systematic approach to refining nanoparticle crystallinity and magnetic behavior, suggesting a deliberate strategy to overcome limitations in thermal conversion efficiency.

The significance of this contribution is evidenced by sustained scholarly attention, with the core paper accumulating 33 citations and follow-up works receiving 11 and 7 citations respectively. Notably, 74.1% of the 27 classified citations originate from independent researchers, indicating that this work has been adopted and built upon by the broader scientific community rather than remaining confined to the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 5

CORE PAPER

[Role of Magnetic Anisotropy on the Hyperthermia Efficiency in Spherical Fe_{3-x}Co_xO₄ \(x = 0–1\) Nanoparticles](#)

2021 · Applied Sciences 11 (3), 930, 2021 · 33 citations (GS)

| No. | Citing paper | Citing institution(s) | Country | S2 |
|-----|---|--|---------------------------------|----|
| 1 | Magnetic Investigation of Se/In Codoped Co_{0.5}Ni_{0.5}Fe₂O₄ Spinel Nanoparticles Synthesized via the Sonochemical Route | Faculty of Engineering, Imam Abdulrahman Bin Faisal University, Istanbul Medeniyet University | Australia, Saudi Arabia, Turkey | — |
| 2 | Tuning the Surface States of Fe₃O₄ Nanoparticles for Enhanced Magnetic Anisotropy and Induction Efficacy | Australian Centre for Neutron Scattering, University of Wollongong | Australia | — |
| 3 | Influence of different magnetic nanoheaters on the thermoresponsive deswelling of pNIPAM/alginate ferrogels for remotely activated release devices | Instituto Nacional de Tecnología Industrial, Universidad de Buenos Aires, Universidad Nacional de La Plata | Argentina | — |
| 4 | Magnetic Field-Modulated Boolean Logic in Proteinoid- Fe₃ O₄ Hybrid Materials | University of the West of England | United Kingdom | — |

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 is Influential signal, Valenzuela et al. 2015), or *Background* (a passing mention).

FOLLOW-UP WORK

[Rare-earth doped BiFe_{0.95}Mn_{0.05}O₃ nanoparticles for potential hyperthermia applications](#)

2022 · Frontiers in Bioengineering and Biotechnology 10, 965146, 2022 · 11 citations (GS)

| No. | Citing paper | Citing institution(s) | Country | S2 |
|-----|---|---------------------------------------|---------------|----|
| 1 | Lead-free halide perovskites for photocatalysis via high-throughput exploration | The University of Tennessee–Knoxville | United States | — |

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).

FOLLOW-UP WORK

[Effects of annealing temperature on the magnetic properties of highly crystalline biphase iron oxide nanorods](#)

2023 · AIP Advances 13 (2), 2023 · 7 citations (GS)

No independent citing papers resolved for this paper in the current crawl.

Contribution 2

Claim — Contribution 2

The researcher developed tunable iron oxide nanostructures with emergent magnetic properties, establishing a foundation for advanced magnetic therapies and metamagnetic materials.

The researcher’s contribution centers on the 2022 core paper regarding emergent magnetism and exchange bias in iron oxide nanocubes. This work established a method for tuning phase and size to control magnetic behavior, serving as the foundation for subsequent investigations into complex magnetic interactions.

This line of work appears to address the challenge of controlling magnetic properties at the nanoscale. By demonstrating tunability in nanocubes, the researcher laid the groundwork for later studies on superparamagnetic superparticles for hyperthermia and metamagnetic transitions in nanorods, suggesting a systematic approach to overcoming size limits and managing competing interactions.

The significance of this research is evidenced by its uptake in the field. The core paper has garnered 12 citations, while follow-up works have accumulated 24 and 14 citations respectively. Notably, 74.1% of citations across this body of work originate from independent researchers, indicating that the broader scientific community recognizes and builds upon these findings.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 8

CORE PAPER

[Emergent magnetism and exchange bias effect in iron oxide nanocubes with tunable phase and size](#)

2022 · Journal of Physics: Condensed Matter 34 (49), 495301, 2022 · 12 citations (GS)

| No. | Citing paper | Citing institution(s) | Country | S2 |
|-----|--|---|-----------------------|----|
| 1 | Magnetization Dynamics in Cobalt-Decorated Cobalt Ferrite Nanocomposites: Implications for High-Frequency Electromagnetic Shielding | — | — | — |
| 2 | Structural and Magnetic Properties of CoFe₂O₄ Nanoparticles in an α-Fe₂O₃ Matrix | Consiglio Nazionale delle Ricerche, Le Mans Université, Università Politecnica delle Marche | France, Italy, Sweden | — |

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).

FOLLOW-UP WORK

Superparamagnetic superparticles for magnetic hyperthermia therapy: overcoming the particle size limit

2025 · ACS Applied Materials & Interfaces 17 (13), 19436-19445, 2025 · 24 citations (GS)

Field-normalised: 18 Semantic Scholar citations place it in the top 10% of Medicine papers from 2025 indexed by Semantic Scholar, by citation count.

| No. | Citing paper | Citing institution(s) | Country | S2 |
|-----|---|--|---------|----|
| 1 | Magnetic hyperthermia-based therapies for cancer targeting: current progress and future perspectives | Chitkara College of Pharmacy, Chitkara University, Lovely Professional University | India | — |
| 2 | Development of Size-Tunable Superparamagnetic Iron Oxide/Fluorescent Conjugated Polymer Composite Nanoparticles for Sentinel Lymph Node Biopsy | The University of Tokyo | Japan | — |
| 3 | Nanomaterials for Theranostic Management of Oral Cancer: Advances in Imaging, Biosensing, Targeted Delivery, and Multimodal Synergistic Therapy | 920th Hospital of Joint Logistics Support Force of Chinese People's Liberation Army, Chengdu Medical College, The Second Affiliated Hospital of Kunming Medical University | China | — |
| 4 | The Dual-Faceted Role of Metal-Based Nanomaterials in Hepatic Fibrosis Therapy | Shandong 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).

FOLLOW-UP WORK

Competing magnetic interactions and field-induced metamagnetic transition in highly crystalline phase-tunable iron oxide nanorods

2023 · Nanomaterials 13 (8), 1340, 2023 · 14 citations (GS)

| No. | Citing paper | Citing institution(s) | Country | S2 |
|-----|--|---|----------------------|----|
| 1 | Leveraging data mining, active learning, and domain adaptation for efficient discovery of advanced oxygen evolution electrocatalysts | Nanjing University, North China Electric Power University, The Hong Kong University of Science and Technology | China, United States | — |
| 2 | Intrinsic magnetotransport and orientation dependent topological Hall effect in EuAuBi | Indian Institute of Technology Delhi, Max-Planck-Institute for Chemical Physics of Solids | Germany, India | — |

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 |
|--|---------------|--------------------------------------|---------------|
| University of South Florida | United States | SCImago #806 · THE 351–400 · QS =654 | 7 |
| University of Houston | United States | SCImago #893 · THE 401–500 · QS =556 | 3 |
| Uppsala University | Sweden | SCImago #349 · THE 128 · QS 93 | 2 |
| Instituto Nacional de Tecnología Industrial | Argentina | — | 1 |
| Xinjiang Second Medical College | China | — | 1 |
| The Second People's Hospital of Qujing City | China | — | 1 |
| Chitkara College of Pharmacy | India | — | 1 |
| Max-Planck-Institute for Chemical Physics of Solids | Germany | — | 1 |
| Yogi Vemana University | India | SCImago #10470 | 1 |
| Sri Krishnadevaraya University | India | SCImago #9459 | 1 |
| Govt. Degree College | India | — | 1 |
| Institute of Integrated Research | — | — | 1 |
| Sumitomo Chemical | Japan | — | 1 |
| Institute of Solid State Chemistry and Mechanochemistry SB RAS | Russia | — | 1 |
| KPJ Healthcare University College | Malaysia | — | 1 |

Geographic distribution of citing authors

| Country | Citing papers |
|----------------|---------------|
| United States | 11 |
| China | 5 |
| India | 4 |
| Japan | 2 |
| Australia | 2 |
| Germany | 2 |
| Saudi Arabia | 2 |
| Sweden | 2 |
| Argentina | 1 |
| Malaysia | 1 |
| Russia | 1 |
| United Kingdom | 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.

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 | Role of Magnetic Anisotropy on the Hyperthermia Efficiency in Spherical Fe _{3-x} CoxO ₄ (x = 0–1) Nanoparticles | 5 | 8 CFR 204.5(h)(3)(v) – Criterion 5 |
| Contribution 2 | Emergent magnetism and exchange bias effect in iron oxide nanocubes with tunable phase and size | 8 | 8 CFR 204.5(h)(3)(v) – Criterion 5 |