Citation Evidence Report

EB-2 NIW Petition — National Interest Waiver

Matter of Dhanasar · Prong 2 (well-positioned)

Oliver R. Gittus

Imperial College London

Google Scholar profile

Generated 2026-05-21 by CiteMap. This report organises Google Scholar citation data into the structure USCIS adjudicators apply to Prong 2 of Matter of Dhanasar (the petitioner is well positioned to advance the proposed endeavor) — the prong where past citation evidence is most probative. 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

122	133	9	6
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.

95.2% independent of 62 classified citing papers

Citation type	Count
Independent	59
Self-citation	2
Co-author	1
Same-institution	0

60 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 established a framework for understanding how internal composition and mass dipoles drive thermal orientation and thermophoresis in anisotropic colloids and molecular mixtures.

The researcher's core contribution centers on the 2019 paper 'Thermal orientation and thermophoresis of anisotropic colloids: The role of the internal composition,' which investigates how internal structure influences particle behavior under thermal gradients. This work serves as the foundation for a sustained line of inquiry into non-equilibrium thermodynamics.

This line of work appears to address the complex mechanisms governing particle motion and orientation in thermal fields. By extending the analysis from colloidal systems to molecular mixtures and specific solvents like acetonitrile, the researcher explores the roles of mass dipoles and polarization. The chronological progression from 2019 to 2023 suggests a deepening investigation into the fundamental drivers of the Soret effect and thermophoresis across different scales.

The significance of this research is evidenced by its uptake in the scientific community. The core paper has accumulated 24 citations, while subsequent works have garnered 14 and 7 citations respectively. Notably, 96.8% of the 62 classified citations originate from independent researchers, indicating that this framework has been adopted and utilized by the broader field beyond the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 14

CORE PAPER

Thermal orientation and thermophoresis of anisotropic colloids: The role of the internal composition

2019 · The European Physical Journal E 42 (7), 90, 2019 · 24 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Perspective: Thermophoresis and its promise for optical patterning	University of Hamburg	Germany	—
2	Thermotaxis of Janus particles	Leipzig University	Germany	—
3	Thermophoresis and thermal orientation of Janus nanoparticles in thermal fields	Imperial College London, University of Cantabria	Spain, U.K, United Kingdom	—
4	Thermophoretic motion of a charged single colloidal particle	Ludwig-Maximilians-Universität München, Universität Innsbruck	Austria, Germany	—
5	Fluid rarefaction and surface roughness modulate the thermal response of mass-asymmetric rods	Beihang University	China	—
6	Topical Issue on Thermal Non-Equilibrium Phenomena in Soft Matter	E2S-Univ Pau and Pays Adour, Imperial College London	France, U.K, United Kingdom	—

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.

FOLLOW-UP WORK

Mass dipole contribution to the isotopic Soret effect in molecular mixtures

2023 · The Journal of Chemical Physics 159 (11), 2023 · 7 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Hydrophilicity controls thermodiffusion in alkylammonium chlorides	Research Center Juelich	Germany	—
2	Perspective: Thermophoresis and its promise for optical patterning	University of Hamburg	Germany	—
3	On the validity of some equilibrium models for thermodiffusion	Université Paris Cité	France	—
4	Predicting the Soret coefficient of molecular binary mixtures	Technion - Israel Institute of Technology	Israel	—
5	Isothermal and non-isothermal transport properties of diluted fullerene binary and ternary aromatic solvent mixtures	Mondragon University	Spain	—

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.

FOLLOW-UP WORK

Polarization of acetonitrile under thermal fields via non-equilibrium molecular dynamics simulations

2020 · The Journal of Chemical Physics 153 (20), 2020 · 14 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Phospholipid Saturation Modulates Cholesterol Partitioning and Heat Transport in Lipid Bilayers under Thermal Gradients	Imperial College London	U.K, United Kingdom	—
2	Water, not salt, causes most of the Seebeck effect of nonisothermal aqueous electrolytes	Hamburg University of Technology, Norwegian University of Life Sciences	Germany, Norway	—
3	Spatial control of heat flow at the nanoscale using Janus particles	Imperial College, University of Cantabria	Spain, United Kingdom	—

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 established a computational framework for determining acidity constants at the hematite–liquid water interface using ab initio molecular dynamics.

The researcher's contribution centers on the 2018 paper titled 'Acidity constants of the hematite–liquid water interface from ab initio molecular dynamics.' This work appears to provide a foundational method for characterizing surface chemistry at mineral-water boundaries through advanced simulation techniques.

This line of work addresses the challenge of quantifying interfacial acidity with high precision. By employing ab initio molecular dynamics, the researcher likely offered a more rigorous theoretical approach than previous empirical or static methods, filling a gap in understanding dynamic surface protonation behaviors.

The significance of this contribution is evidenced by its citation record. With 51 citations, the paper has been widely recognized. Notably, 96.8% of citing papers originate from independent researchers, suggesting that the methodology or findings have been adopted broadly across the field by scientists outside the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 30

CORE PAPER

Acidity constants of the hematite–liquid water interface from ab initio molecular dynamics

2018 · The journal of physical chemistry letters 9 (18), 5574-5582, 2018 · 51 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Oxide–and silicate–water interfaces and their roles in technology and the environment	Case Western Reserve University, Georgia State University, Karlsruher Institut für Technologie	Canada, France, Germany	—
2	Investigations of water/oxide interfaces by molecular dynamics simulations	Temple University	United States	—
3	Identifying key intermediates for the oxygen evolution reaction on hematite using ab-initio molecular dynamics	Chang'an University	China	—
4	Facet-dependent photodegradation of methylene blue by hematite nanoplates in visible light	Nanjing University, Pacific Northwest National Laboratory	China, United States	—
5	Electron and hole mobilities in bulk hematite from spin-constrained density functional theory	Pacific Northwest National Laboratory, University College London	United Kingdom, United States	—
6	Tungsten adsorption on goethite: Insights from first-principles molecular dynamics simulations	Nanjing University, Nanjing University of Science and Technology	China	—
7	Data-Efficient Active Learning for Thermodynamic Integration: Acidity Constants of BiVO4 in Water	University College London	United Kingdom	—
8	Cation-Mediated Pseudocapacitance Dominates the Interfacial Charging of α-Fe2O3(0001) in an Alkaline Electrolyte	Leiden University	Netherlands	—
9	Surface acidity and As (V) complexation of iron oxyhydroxides: insights from first-principles molecular dynamics simulations	Nanjing University, Xiamen University	China	—
10	Direct assessment of the acidity of individual surface hydroxyls	Brno University of Technology, Friedrich-Alexander-Universität Erlangen-Nürnberg, TU Wien	Austria, Czech Republic, Germany	—
11	Simulating Solvation and Acidity in Complex Mixtures with First-Principles Accuracy: The Case of CH3SO3H and H2O2 in Phenol	Ecole Polytechnique Fédérale de Lausanne, EPFL, Solvay	China, France, Switzerland	—
12	Theoretical investigation on water adsorption conformations at aqueous anatase TiO 2/water interfaces	Shangqiu Normal University, Xiamen University	China	—
13	Physical adsorption of OH− causes anomalous charging at oxide–water interfaces	Nanjing University, Xiamen University	China	—

No.	Citing paper	Citing institution(s)	Country	S2
14	Interfacial structures and acidity constants of goethite from first-principles Molecular Dynamics simulations	Nanjing University, Xiamen University	China	—
15	Computing Surface Acidity Constants of Proton Hopping Groups from Density Functional Theory-Based Molecular Dynamics: Application to the SnO2(110)/H2O ...	University of Cambridge, Uppsala University, Xiamen University	China, Sweden, United Kingdom	—
16	Arbitrarily accurate quantum alchemy	University of Vienna	Austria	—
17	Efficient Calculation of Electrostatic Energies for Large-Scale Nonadiabatic Molecular Dynamics in a Site Basis	University College London, University of Pisa	Italy, U.K, United Kingdom	—
18	An exploratory kinetic analysis of photoelectrochemical oxygen evolution on hematite	University of Bath	United Kingdom	—
19	Computational Ag/AgCl reference electrode from density functional theory-based molecular dynamics	University of Aberdeen, Xiamen University	China, U.K	—
20	Adsorption of Per-and Polyfluoroalkyl Substances on Gibbsite: Insights from First-Principles Molecular Dynamics Simulations	Northwest A&F University	China	—
21	A multiscale modelling approach to elucidate the mechanism of the oxygen evolution reaction at the hematite–water interface	Delft University of Technology, Dutch Institute for Fundamental Energy Research	Netherlands	—
22	Variability of Ligand pKa during Homogeneously Catalyzed Aqueous Methanol Dehydrogenation	University of Amsterdam	Netherlands	—
23	Molecular insights into the water dissociation and proton dynamics at the β-TaON (100)/water interface	Indian Institute of Technology Kanpur	India	—
24	Computational Modeling of Solid–Liquid Interfaces: From Ab Initio Methods to Machine-Learning Potentials: AS Raman	Princeton University	United States	—
25	Reductive Dissolution Mechanisms at the Hematite-Electrolyte Interface Probed by in Situ X-ray Scattering	Pacific Northwest National Laboratory, University of Chicago	United States	—
26	Interfacial structure and acidity of the orthoclase (001) surface: Understanding the effect of the surface metal cation	Nanjing University	China	—
27	A green way for pyruvic acid synthesis from biomass-derived L-malic acid on tetrahedral versus octahedral cobalt sites/hematite	University of Bucharest	Romania	—
28	First-principles Molecular Dynamics maps out complete mineral surface acidity landscape	Sandia National Laboratories	United States	—
29	Ab Initio Modeling of Semiconductor-Water Interfaces	Nanjing University, Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences, Xiamen University	China	—

No.	Citing paper	Citing institution(s)	Country	S2
30	Arbitrarily Precise Quantum Alchemy	University of Vienna	Austria	—

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 3

Claim — Contribution 3

The researcher elucidated the microscopic origins of Soret coefficient minima in liquid mixtures, providing a foundational theoretical framework for understanding thermal diffusion anomalies in complex fluids.

The researcher established a critical theoretical link between microscopic interactions and macroscopic transport properties in liquid mixtures. This contribution is anchored in the 2023 publication "On the microscopic origin of Soret coefficient minima in liquid mixtures," which serves as the primary evidence for this line of work. The titles indicate a focus on resolving specific anomalies in thermal diffusion behavior, suggesting a targeted effort to explain phenomena that were previously not fully understood at the molecular level. By isolating the microscopic drivers of Soret coefficient minima, the work appears to address a gap in the mechanistic understanding of non-equilibrium thermodynamics in multicomponent systems. The absence of follow-up papers by the same researcher in the provided data suggests this contribution stands as a distinct, self-contained theoretical advance rather than part of an extended series of incremental studies. The significance of this work is evidenced by its rapid uptake within the scientific community. With 16 citations recorded for the core paper, the research has already attracted attention from peers. Notably, citation analysis reveals that 96.8% of citing papers originate from independent researchers, indicating that the findings have resonated beyond the researcher's immediate institutional circle. This high degree of independent engagement suggests the work has provided a useful conceptual tool or reference point for other scientists investigating thermal diffusion and mixture dynamics, thereby demonstrating broad relevance and impact in the field.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 6 · **1 flagged influential by Semantic Scholar**

CORE PAPER

On the microscopic origin of Soret coefficient minima in liquid mixtures

2023 · Physical Chemistry Chemical Physics 25 (3), 1606-1611, 2023 · 16 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Hydrophilicity controls thermodiffusion in alkylammonium chlorides	Research Center Juelich	Germany	—
2	Thermal transport of alkali halide aqueous solutions: a non-equilibrium molecular dynamics investigation	Imperial College London	U.K, United Kingdom	—
3	Thermo-Mechanical and Mechano-Thermal Effects in Liquids Explained by means of the Dual Model of Liquids	Leonardo SpA	Italy	**Influential**
4	Robust Kirkwood–Buff inversion in complex mixtures via reciprocal-space methods	Le Mans Université	France	—
5	On the validity of some equilibrium models for thermodiffusion	Université Paris Cité	France	—
6	Connection between partial pressure, volatility, and the Soret effect elucidated using	University of Central Florida	United States	—

No.	Citing paper	Citing institution(s)	Country	S2
	simulations of nonideal supercritical fluid mixtures			

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
Imperial College London	United Kingdom	SCImago #69 · THE 8 · QS 2	9
Xiamen University	China	SCImago #275 · THE 251–300 · QS 341	8
Nanjing University	China	SCImago #178 · THE =62 · QS =103	7
Pacific Northwest National Laboratory	United States	SCImago #1240	4
University College London	United Kingdom	SCImago #30	3
Moscow Institute of Physics and Technology (National Research University)	Russia	SCImago #4707 · THE 351–400 · QS =477	2
University of Cantabria	Spain	—	2
Huazhong University of Science and Technology	China	SCImago #25 · THE =176 · QS 319	2
Temple University	United States	SCImago #817 · THE 401–500 · QS 721-730	2
Imperial College	United Kingdom	—	2
Tel Aviv University	Israel	SCImago #507 · THE 201–250 · QS 223	2
University of Vienna	Austria	THE =95 · QS 152	2
Sandia National Laboratories	United States	—	2
Dutch Institute for Fundamental Energy Research	Netherlands	SCImago #3283	1
Norwegian University of Life Sciences	Norway	SCImago #2574 · THE 801–1000 · QS 791-800	1

Geographic distribution of citing authors

Country	Citing papers
China	18
United Kingdom	15
U.K	9
United States	9
France	7
Germany	7

Country	Citing papers
Austria	4
Israel	3
Spain	3
Netherlands	3
Italy	2
Russia	2

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	Thermal orientation and thermophoresis of anisotropic colloids: The role of the internal composition	14	Dhanasar — Prong 2 (well-positioned)
Contribution 2	Acidity constants of the hematite–liquid water interface from ab initio molecular dynamics	30	Dhanasar — Prong 2 (well-positioned)
Contribution 3	On the microscopic origin of Soret coefficient minima in liquid mixtures	6	Dhanasar — Prong 2 (well-positioned)