Citation Evidence Report

EB-2 NIW Petition — National Interest Waiver

Matter of Dhanasar · Prong 2 (well-positioned)

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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 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

130	131	23	4
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.

92.5% independent of 120 classified citing papers

Citation type	Count
Independent	111
Self-citation	4
Co-author	5
Same-institution	0

10 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 microwave-assisted hydrothermal synthesis of D-glucose-derived carbon dots, establishing a foundational methodology for tunable optical properties in sustainable nanomaterials.

The researcher's core contribution rests on a 2018 study detailing the particulate, structural, and optical properties of D-glucose-derived carbon dots synthesized via microwave-assisted hydrothermal treatment. This work established a reproducible framework for creating carbon dots from renewable biomass sources, focusing on their fundamental physical characteristics.

This line of work appears to address the need for scalable, eco-friendly synthesis methods for carbon dots with controllable optical features. By moving from the initial characterization of glucose-derived dots to subsequent studies on glycothermal synthesis for color-tunable displays and solvent-dependent photoluminescence, the researcher systematically expanded the functional utility of these materials. The progression suggests a deliberate effort to refine synthesis parameters for specific applications, such as wide-color-gamut displays, while exploring the influence of precursors like L-cysteine and solvent environments on fluorescence.

The significance of this research is evidenced by sustained independent interest. The core paper has accumulated 40 citations, while follow-up works have garnered 47 and 20 citations respectively. Notably, 92.6% of the 121 classified citations originate from independent researchers, indicating that the broader scientific community has adopted and built upon these synthesis strategies and material characterizations outside the researcher's immediate circle.

INDEPENDENT CITATIONS FOR THIS CONTRIBUTION: 90 · **1 flagged influential by Semantic Scholar**

CORE PAPER

Particulate, structural, and optical properties of D-glucose-derived carbon dots synthesized by microwave-assisted hydrothermal treatment

2018 · ECS Journal of Solid State Science and Technology 7 (1), R3034-R3039, 2018 · 40 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Biochar as a support for nanocatalysts and other reagents: Recent advances and applications	Université Bordeaux 1	France	—
2	A strategic review on carbon quantum dots for cancer-diagnostics and treatment	—	—	Background
3	High quantum yield nitrogen-doped carbon quantum dot-based fluorescent probes for selective sensing of 2, 4, 6-trinitrotoluene	—	—	—
4	Heteroatom-doped carbon quantum dots and polymer composite as dual-mode nanoprobe for fluorometric and colorimetric determination of picric acid	—	—	—
5	Synthetic waste derived graphitic carbon nitride (g-CN) and g-CN/carbon hybrid for supercapacitors	Graphic Era University, Indian Institute of Technology Mandi, Thapar Institute of Engineering & Technology	Canada, India	—
6	Optical properties of carbon dots synthesized by the hydrothermal method	North-Eastern Federal University	Russia	Background
7	Carbon dot-based fluorescent sensor for selective and sensitive detection of persulfate	Lyuliang University	China	—

No.	Citing paper	Citing institution(s)	Country	S2
8	Sustainable development of carbon nanodots technology: Natural products as a carbon source and applications to food safety	National Chiayi University	Taiwan	—
9	Numerical evaluations of curcumin organic molecule and an experimental study on hybrid photodetector performance in visible and UV regions	Atatürk University, University of Sfax	Tunisia, Turkey	—
10	Synthesis and characterization of a novel erbium doped poly (vinyl alcohol) films for multifunctional optical materials	—	—	—
11	Sensitive fluorometric determination of picric acid and antioxidant stabilizers in propellant compositions using amine-rich nitrogen-doped carbon quantum …	Istanbul University-Cerrahpaşa	Turkey	—
12	Density functional theory model for carbon dot surfaces and their interaction with silver nanoparticles	Universidad Nacional del Sur	Argentina	—
13	Carbon quantum dots as multifunctional nanomaterials for sustainable optoelectronic biosensing and green photonics	—	—	—
14	Carbon nanodots derived from natural products	Universitas Airlangga	Indonesia	—
15	Spectroscopy study of polyvinyl alcohol/carbon dots composite films	Indonesian Institute of Sciences, IPB University	Indonesia	—
16	Precursor concentration effect on optical properties of carbon dots from Cassava's peels	—	—	—
17	Ultrasonic-assisted melt blending for polyvinyl alcohol/carbon dots luminescent flexible films	Indonesian Institute of Sciences	Indonesia	—
18	The effect of poly (ethylene glycol) on the photoluminescence properties of carbon dots from cassava peels synthesized by hydrothermal methods	—	—	—
19	Highly precise determination of structural and optical parameters of an innovative (PVA-VOCl) for flexible polymer-semiconductor devices	—	—	—
20	Supporting information Microwave Assisted Hydrothermal Carbonization and Solid State Postmodification of Carbonized Polypropylene	KTH Royal Institute of Technology	Sweden	—
21	Biomass-derived carbon quantum dots–A review. Part 1: Preparation and characterization (2021)	—	—	—
22	L-Pro functionalized carbon nanoclusters inducing an enantioselective voltammetric response to Trp and Tyr (2025)	Institute of Molecular Biology and Pathology, Sapienza University of Rome	Italy	—

No.	Citing paper	Citing institution(s)	Country	S2
23	Carbon dots labeled Lactiplantibacillus plantarum: a fluorescent multifunctional biocarrier for anticancer drug delivery (2023)	—	—	—
24	Fluorescence of D-glucose-derived carbon dots: effect of process parameters (2024)	—	—	Methodology
25	Unveiling the Photocatalytic Activity of Carbon Dots/gC3N4 Nanocomposite for the O-Arylation of 2-Chloroquinoline-3-carbaldehydes (2023)	Ain Shams University, Northern Border University	Egypt, Saudi Arabia	—
26	A study of thermal stability, vibrational spectroscopy, electric response and linear and nonlinear optical properties of pure PVP polymer for solar cell and NLO devices (2023)	—	—	—
27	Karakterisasi Sifat Optik C-Dots dari Kulit Luar Singkong Menggunakan Teknik Microwave (2018)	Indonesian Institute of Sciences, Universitas Muhammadiyah Prof Dr Hamka	Indonesia	—
28	Re-Ekstraksi Aspal Buton Kabungka Dengan Menggunakan Solven Kondensat Bensin (2016)	Universitas Dayanu Ikhsanuddin	Indonesia	—
29	Electrochemistry and photophysics of carbon nanodots-decorated nigs (Ni (In, Ga) Se2) quantum dots (2020)	University of the Western Cape	South Africa	—
30	Cu3TiO4/Carbon Dots/gC3N4 Heterojunction: An Efficient Photocatalyst for Multifarious Reactions (2025)	—	—	—

Showing the 30 most-cited of 34 independent citing papers.

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 Fluorescence of D-glucose-derived carbon dots: effect of process parameters

"Furthermore, the presence of hydroxyl and carbonyl groups remaining after the decomposition of the sugar molecule deposited on the surface can increase the stability of CDs in water and induce a photoluminescence effect [4, 12]."

FOLLOW-UP WORK

Glycothermally synthesized carbon dots with narrow-bandwidth and color-tunable solvatochromic fluorescence for wide-color-gamut displays

2021 · ACS omega 6 (2), 1741-1750, 2021 · 47 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	Lasing of carbon dots: Chemical design, mechanisms, and bright future	Zhengzhou University	China	—
2	The light of carbon dots: From mechanism to applications	Zhengzhou University	China	—

No.	Citing paper	Citing institution(s)	Country	S2
3	Green-synthesised carbon nanodots: A SWOT analysis for their safe and sustainable innovation	University of Birmingham	United Kingdom	—
4	Recent advances of solvent-engineered carbon dots: A review	Anhui University of Technology, Central South University	China	—
5	Hydrothermal synthesis of high-yield red fluorescent carbon dots with ultra-narrow emission by controlled O/N elements	—	—	—
6	Pure-violet oxygen-doped carbon quantum rings with near-unity quantum yield and a full-width at half-maximum of 18 nm	—	—	Influential
7	Surface modification functionalized carbon dots	—	—	—
8	Solvent effects on fluorescence properties of carbon dots: implications for multicolor imaging	—	—	—
9	Narrow-Bandwidth Emissive Carbon Dots: Regulation of Optical Properties and Applications	—	—	—
10	Carbon dots for carbon dummies: the quantum and the molecular questions among some others	—	—	—
11	Multicolour carbon dots with excitation-independent emission by microwave solvothermal reaction	—	—	—
12	Carbon Dots and Their Films with Narrow Full Width at Half Maximum Orange Emission	Changchun University of Science and Technology, Taiyuan University of Technology	China	Methodology
13	Blue-Light-Excited Cyan-Emitting Carbon-Dot-Ormosil Gel for Blue-Overshoot Mitigation and Cyan-Gap Bridging in WLEDs	—	—	—
14	Water-soluble photoluminescent carbon dots prepared from phloroglucinol by catalyst-and solvent-free reaction	—	—	—
15	Programmable luminescent platform based on carbon quantum dots enables wavelength-multiplexed optical data storage and encryption	—	—	—
16	Solvatochromic Carbon Dots	—	—	—
17	Matrix-assisted synthesis of narrow-bandwidth solid-state emissive carbon dots with high PLQY for application in photoluminescence LEDs	Taiyuan University of Technology	China	—
18	Graphene Quantum Dots for High-Sensitivity and Selective Detection of Industrial Wastewater Components	—	—	—

No.	Citing paper	Citing institution(s)	Country	S2
19	Investigation into Red Emission and Its Applications: Solvatochromic N-Doped Red Emissive Carbon Dots with Solvent Polarity Sensing and Solid-State …	Politecnico di Torino, University of Miami, William Paterson University	Italy, United States	—
20	_ _Prayogik Rasayan	Vellore Institute of Technology	India	—
21	Synthesis and characterization of carbon quantum dots by microwave heating method	University of Calgary	Canada	—
22	Highly fluorescent nitrogen-doped carbon dots with large Stokes shifts (2023)	Oregon State University	United States	—
23	First-principles study on the modulation mechanism of solvent effect on the fluorescence emission of carbon dots (2024)	China Institute of Atomic Energy, Hebei University, University of Missouri–Kansas City	China, United States	—
24	Carbon dots: small materials with big impacts on optoelectronic devices (2025)	—	—	—
25	Photostable carbon dots with intense green emission in an open reactor synthesis (2022)	University of Bari Aldo Moro, University of Cagliari	Italy	—
26	Phloroglucinol-based carbon quantum dots/polyurethane composite films: How structure of carbon quantum dots affects antibacterial and antibiofouling … (2024)	Jožef Stefan Institute, University of Belgrade	Serbia, Slovenia	—
27	Uniform blue emitting carbon nanodots synthesized from fig fruit using reverse diffusion purification (2024)	King Abdulaziz University, King Abdullah University of Science and Technology, Ministry of Health	Saudi Arabia, United States	—
28	Catalytic degradation of methylene blue using iron and nitrogen-containing carbon dots as Fenton-like catalysts (2022)	RMIT University	Australia	—
29	Investigation into red emission and its applications: Solvatochromic N-doped red emissive carbon dots with solvent polarity sensing and solid-state fluorescent … (2023)	Politecnico di Torino, University of Miami, William Paterson University	Italy, United States	—
30	Solvatochromism provoked multi-emissive polyethylenimine assimilated carbon dots for fluorescence sensing and adsorptive removal of copper and bismuth ions in … (2025)	Madurai Kamaraj University	India	—

Showing the 30 most-cited of 39 independent citing papers.

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 Carbon Dots and Their Films with Narrow Full Width at Half Maximum Orange Emission

> *"However, there have been related reports on narrow FWHM solid-state emissive CDs. Yoshinaga et al. [10] prepared CDs by heating phloroglucinol in a glycol solution of 1,2-pentanediol and, then, dispersed them in polyvinyl alcohol (PVA) and polyvinyl pyrrolidone (PVP) matrices to achieve solid-state…"*

FOLLOW-UP WORK

Photoluminescence properties of l-cysteine-derived carbon dots prepared in non-aqueous and aqueous solvents

2020 · Journal of Luminescence 224, 117260, 2020 · 20 citations (GS)

No.	Citing paper	Citing institution(s)	Country	S2
1	A comparative study of Fe (II) doped chiral L/D-methionine carbon dots (MCDs) as a “Turn-on” fluorescent probe for the sensitive detection of L–cysteine	University of Kerala	India	—
2	Carbon dots derived from the maillard reaction for pH sensors and Cr (VI) detection	Northeast Agricultural University	China	—
3	Sulphonated Carbon Dots Synthesized Through a One-Pot, Facile and Scalable Protocol Facilitates the Preparation of Renewable Precursors Using Glucose …	—	—	—
4	Case Studies in Chemical and Environmental Engineering	Swansea University	United Kingdom	—
5	Synthesis of fluorescent citric acid carbon dots composites derived from empty fruit bunches of palm oil tree and its anti-bacterial property	Nanyang Technological University, Universitas Sumatera Utara	Indonesia, Singapore	—
6	Síntesis de puntos cuánticos de carbono obtenidos a partir de cáscara de chontaduro: funcionalización con biomoléculas y aplicación en la detección de iones Hg2+ …	Universidad Nacional de Colombia	Colombia	—
7	Recent advances of solvent-engineered carbon dots: A review (2023)	Anhui University of Technology, Central South University	China	—
8	Synthesis, properties, and utilization of carbon quantum dots as photocatalysts on degradation of organic dyes: A mini review (2024)	Nanyang Technological University, Universitas Sumatera Utara	Indonesia, Singapore	—
9	Environmentally sustainable synthesis of whey-based carbon dots for ferric ion detection in human serum and water samples: evaluating the greenness of the method (2024)	University of Garmian, University of Sulaimani	Iraq	—
10	Synthesis of fluorescent citric acid carbon dots composites derived from empty fruit bunches of palm oil tree and its anti-bacterial property (2022)	Nanyang Technological University, Universitas Sari Mutiara Indonesia, Universitas Sumatera Utara	Indonesia, Singapore	—
11	L-cysteine modified N-doped carbon quantum dots derived from peach palm (Bactris gasipaes) peels for detection of mercury ions (2024)	Universidad Nacional de Colombia	Colombia	—
12	Nitrogen-doped arginine carbon dots and its metal nanoparticle composites as antibacterial agent (2020)	Çanakkale Onsekiz Mart Üniversitesi, University of South Florida	Turkey, United States	—
13	Influence of N-, S-, and B-doped carbon quantum dots modification on the photocatalytic degradation performance of ZnO (2025)	Minzu University of China	China	—

No.	Citing paper	Citing institution(s)	Country	S2
14	Preparation of nitrogen-doped carbon dots from coke powder as a fluorescent chemosensor for selective and sensitive detection of Cr (VI) (2022)	—	—	—
15	Nitrogen-Doped Arginine Carbon Dots and Its Metal Nanoparticle Composites as Antibacterial Agent (2020)	Çanakkale Onsekiz Mart Üniversitesi, University of South Florida	Turkey, United States	—
16	Carbon dots as promising carbon nanomaterials for diagnostics, therapeutics, and regenerative orofacial applications (2025)	Egyptian Atomic Energy Authority, Imam Abdulrahman Bin Faisal University, Pharos University in Alexandria	Egypt, Saudi Arabia, South Korea	—
17	Synthesis of green fluorescent carbon dots using cysteine and maltose as ecofriendly ligands for the detection of venlafaxine anti-depression drug in pharmaceutical … (2024)	Chung-Ang University	South Korea	—

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
Keio University	Japan	SCImago #965 · THE 601–800 · QS =215	5
Nanyang Technological University	Singapore	SCImago #137	3
Indonesian Institute of Sciences	Indonesia	—	3
Universitas Sumatera Utara	Indonesia	THE 1501+ · QS 1001-1200	3
University of the Western Cape	South Africa	SCImago #4397 · THE 601–800 · QS 951-1000	2
Mansoura University	Egypt	SCImago #2314 · THE 801–1000 · QS 1001-1200	2
Istanbul University-Cerrahpaşa	Turkey	SCImago #6729 · THE 1201–1500	2
Tianjin University of Science and Technology	China	SCImago #1970	2
Zhengzhou University	China	SCImago #101 · QS =618	2
University of South Florida	United States	SCImago #806 · THE 351–400 · QS =654	2
William Paterson University	United States	SCImago #6727	2
Anhui University of Technology	China	SCImago #5065	2
Çanakkale Onsekiz Mart Üniversitesi	Turkey	SCImago #5933	2
Central South University	China	SCImago #42 · THE 251–300 · QS =491	2

Institution	Country	World ranking	Citing papers
University of Miami	United States	SCImago #545 · THE 201–250 · QS =314	2

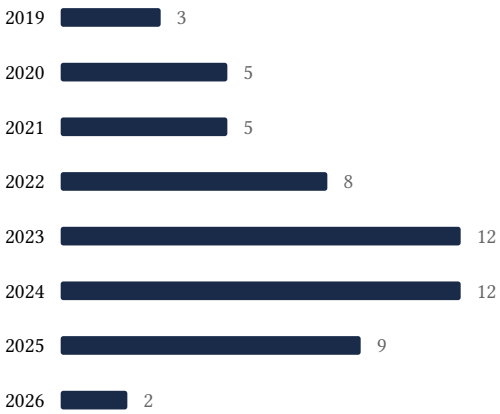
Geographic distribution of citing authors

Country	Citing papers
China	19
Indonesia	9
United States	8
India	7
Japan	6
Saudi Arabia	5
Turkey	5
Egypt	4
Italy	4
United Kingdom	3
Malaysia	3
South Korea	3

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).

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	Particulate, structural, and optical properties of D-glucose-derived carbon dots synthesized by microwave-assisted hydrothermal treatment	90	Dhanasar — Prong 2 (well-positioned)