# Eric Selorm Agorku

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## PROFILE

Professor Eric Selorm Agorku is an associate professor in the Department of Chemistry at Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana. He holds a Bachelor of Science degree in Chemistry (Hons), a Master of Science in Inorganic Chemistry, and a Doctor of Philosophy (PhD) in Chemistry.

Prof. Agorku's career in academia and research spans multiple countries and areas of expertise. In 2014, he was awarded the prestigious South Africa NRF-RISA Innovation Doctoral Scholarship, under which he conducted cutting-edge research on "Metal and Nonmetal Doped Semiconductor Photocatalysts for Water Treatment" at the University of Johannesburg (UJ) under the mentorship of Prof. Ajay Kumar. During this period, he also worked as an Assistant Lecturer at UJ, from 2014 to 2015, and later as a Postdoctoral Fellow in 2015 under the UJ Global Excellence and Stature Scholarship.

His research interests are diverse and impactful, with a strong focus on environmental chemistry and materials science. Key areas of his work include:

-Environmental monitoring, particularly the detection of pesticides and heavy metals in water, fish, and sediments.

-Determining hydroquinone levels in cosmetic creams.

-Synthesis and characterization of smart polymers for slow-release applications in agro-chemicals.

-Development of molecularly imprinted polymers as sorbents for pesticide detection in environmental samples.

-Fabrication of doped semiconductor photocatalysts for visible-light-driven environmental remediation of pollutants in water.

-Creation of semiconductor nanocomposites for gas sensor applications.

-Designing graft biopolymer composites for water treatment and oil spill recovery.

As an expert chemical consultant and formulation chemist, Prof. Agorku has contributed significantly to both academia and industry. His role as the Head of the Glassblowing Unit in the Department of Chemistry at KNUST highlights his commitment to advancing scientific infrastructure and education.

Prof. Agorku’s interdisciplinary research has made him a valuable resource in the field of environmental remediation and materials science, with ongoing projects that focus on addressing key environmental and industrial challenges.

## RESEARCH

| | |
|---|---|
| Interests | inorganic · photocatalysis · membrane technology · environmental · nanotechnology |
| Areas | Renewable Energy, Sustainability and the Environment · Materials Chemistry · Electrical and Electronic Engineering · Water Science and Technology · Biomedical Engineering · Health, Toxicology and Mutagenesis |

## RESEARCH SUMMARY

| 79 | 1,476 | 23 | 36 | 1.72 | 13% |
|---|---|---|---|---|---|
| Publications | Citations | h-index | i10-index | Field-weighted impact | World top 10% |

Counted from the 79 publications listed below, 2004–2026. Field-weighted impact is the mean over the 71 works scored for it; 1.00 is the world average for works of the same field, type and year. 9 of the 71 papers scored for it are among the world's most cited tenth for their field, type and year.

## POSITIONS

**Kwame Nkrumah University of Science and Technology**
Kumasi, Ghana

## EDUCATION AND QUALIFICATIONS

**PhD** 2012–2015
Applied Chemistry, University of Johannesburg, Johannesburg, South Africa

**MPhil Inorganic Chemistry** 2004–2006
Chemistry, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

**BSc. Chemistry** 1999–2003
Chemistry, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

## PUBLICATIONS

### Journal articles 78

1. Elikplim Nyabi, Andrews Ayim Oduro, Roland Tsoeke Agbetsi, Gideon Addai, Sampson Kofi Kyei, Francis Opoku, Ray Bright Voegborlo, **Eric Selorm Agorku** (2026). Activated clay/ Opuntia microdasys incorporated polyvinyl alcohol membranes for fouling mitigation in wastewater filtration. *Materials Advances*. https://doi.org/10.1039/d5ma00423c
2. Bernice Yram Danu, Charles Kwame Bandoh, John Kwabena Adusei, Moro Haruna, Ahmed Kangmennaa, Prince Yeboah, Francis Kofi Ampong, **Eric Selorm Agorku** (2026). Carbon-based materials for the removal of organic dyes from wastewater. *Discover Nano*. https://doi.org/10.1186/s11671-026-04445-5
3. Sampson Kofi Kyei, Kelvin Nkrumah, Benjamin Tetteh Swanzy Donkor, **Eric Selorm Agorku**, Onyewuchi Akaranta (2026). Cashew nutshell liquid derivatives as a sustainable route to alkyd-free surface coatings. *Scientific Reports*. https://doi.org/10.1038/s41598-026-35993-6
4. Paul Osei, Bismark Tetteh Padi, Elikplim Nyabi, Mandela Toku, Sampson Kofi Kyei, **Eric Selorm Agorku** (2026). Enhanced Fouling Control Using PVA-Clay-Magnetic Composite Membranes in Water Treatment Systems. *Journal of Inorganic and Organometallic Polymers and Materials*. https://doi.org/10.1007/s10904-026-04320-x
5. Moro Haruna, **Eric Selorm Agorku**, Noah Kyame Asare-Donkor, Francis Opoku (2026). First-principles investigation of a promising type-II SiN/SiCH van der Waals heterojunction with superior optical absorption, electronic properties and photocatalytic potential for overall water-splitting. *Molecular Catalysis*. https://doi.org/10.1016/j.mcat.2026.115845
6. Moro Haruna, **Eric Selorm Agorku**, Noah Kyame Asare–Donkor, Francis Opoku (2026). Highly efficient photocatalytic water splitting in Type–II InP/BiSeI van der Waals heterostructures: A first–principles insight. *Journal of Physics and Chemistry of Solids*. https://doi.org/10.1016/j.jpcs.2026.114116
7. Gerheart Winfred Ashong, Wisdom Kwame Nyatuame, Flora Amerley Amarh, Dogbey Bright Agbeko, Ray Bright Voegborlo, **Eric Selorm Agorku**, Michael Yaw Peasah (2026). Monitoring, source apportionment, and health risk implications of potentially toxic element concentrations in canned fish products within Kumasi metropolis, Ghana. *Food Chemistry Advances*. https://doi.org/10.1016/j.focha.2026.101234

8. Atta Alhassan, Mary Nkansah Konadu, Elikplim Nyabi, Ahmed Kangmennaa, Timothy Kofi Amegbletor, Mandela Toku, Francis Opoku, Ray Bright Voegborlo, **Eric Selorm Agorku** (2026). Sodium alginate grafted polyacrylamide reinforced with coir pith for hydrocarbon removal in simulated saline water. *Next Materials*. https://doi.org/10.1016/j.nxmate.2026.103095

9. Moro Haruna, Charles Kwame Bandoh, Francis Opoku, **Eric Selorm Agorku** (2025). Ab initio and experimental study of sulphur/samarium codoped-TiO2 and its visible light photocatalytic activity towards the degradation of orange II dye. *Next Sustainability*. https://doi.org/10.1016/j.nxsust.2025.100155

10. Elikplim Nyabi, Roland Tsoeke Agbetsi, Gideon Addai, Francis Opoku, Mandela Toku, Ray Bright Voegborlo, **Eric Selorm Agorku** (2025). Activated clay and cocoa nib shells-integrated polyvinyl alcohol membranes for fouling mitigation in water treatment. *Next Sustainability*. https://doi.org/10.1016/j.nxsust.2025.100136

11. Francis Opoku, **Eric Selorm Agorku**, Albert Aniagyei, Penny Poomani Govender (2025). Boosting photocatalytic hydrogen evolution through a Z-scheme BlueP/GaGeNO van der Waals heterostructure design. *Physical Chemistry Chemical Physics*. https://doi.org/10.1039/d5cp03878b

12. Richard Tsiwah Cobbinah, Nathaniel Owusu Boadi, Selina Ama Saah, **Eric Selorm Agorku**, Mercy Badu, Nii Korley Kortei (2025). Cancer risk from heavy metal contamination in fish and implications for public health. *Scientific Reports*. https://doi.org/10.1038/s41598-025-08488-z

13. Kofi Duodu, Gerheart Winfred Ashong, Tsoeke Roland Agbetsi, Jonah Wuloh, Ahmed Kangmennaa, Charity Ohemaa Agyapong, Nathaniel Owusu Boadi, **Eric Selorm Agorku** (2025). Congo red adsorption in water using a novel nano zero-valent iron intercalated Zn–Al–CO3 layered double hydroxide: adsorption isotherm, kinetics and thermodynamics. *Discover Applied Sciences*. https://doi.org/10.1007/s42452-025-06616-y

14. Andrews Ayim Oduro, Wisdom Selassie Seaneye, Kodwo Miezah, Willliam Wilson Anku, **Eric Selorm Agorku** (2025). Defluorination of borehole water using activated clay and bauxite-laden polyvinyl alcohol hybrid membranes. *RSC Applied Polymers*. https://doi.org/10.1039/d5lp00188a

15. Kofi Duodu, Gerheart Winfred Ashong, Francis Opoku, Nathaniel Owusu Boadi, **Eric Selorm Agorku** (2025). Equilibrium, kinetic and thermodynamic studies of the adsorption of Congo red on nZVI/Zn-Al layered double hydroxide intercalated with PO43− ion. *Discover Sustainability*. https://doi.org/10.1007/s43621-025-00979-3

16. Francis Opoku, **Eric Selorm Agorku**, Michael Kumi, Penny Poomani Govender (2025). Exploring the anodic performance of InSnPS/GaGeAsSe heterostructure as an ultra-high rate rechargeable Li ion battery via first-principles study. *Physical Review Materials*. https://doi.org/10.1103/vlv3-13gd

17. Charles Kwame Bandoh, Moro Haruna, David Adu-Poku, Bernice Yram Danu, Ophelia Pinto, Mandela Toku, Mercy Badu, **Eric Selorm Agorku**, Francis Kofi Ampong, Robert Kwame Nkum (2025). Gd-doped ZnO-g-C3N4 nanocomposite: a novel photocatalyst for the photodegradation of eosin yellow dye in water. *Discover Applied Sciences*. https://doi.org/10.1007/s42452-025-06759-y

18. Sampson Kofi Kyei, Alex Justice Frimpong, **Eric Selorm Agorku**, William Iheanyi Eke, Onyewuchi Akaranta (2025). Onion (Allium cepa L.) skin waste for industrial applications: A sustainable strategy for value addition and circular economy. *Bioresource Technology Reports*. https://doi.org/10.1016/j.biteb.2025.102094

19. Andrews Ayim Oduro, Stephanie A. B. Biney, Edith Shormey Nortey, Ahmed Kangmennaa, Richard Baffour Forkuo, **Eric Selorm Agorku** (2025). Polyvinyl Alcohol Embedded Activated Clay/Hydroxyapatite Membranes for Fouling Control During the Removal of an Organic Dye in Water. *Journal of Applied Polymer Science*. https://doi.org/10.1002/app.56701

20. Moro Haruna, Agnes Tutuwaa, Mandela Toku, Francis Opoku, **Eric Selorm Agorku**, Noah Kyame Asare-Donkor, Anthony Apeke Adimado (2025). The efficacy of cerium Codoped–ZrO2–rGO in degrading eosin yellow dye under visible light: A combined DFT calculation and mechanism insight. *Next Materials*. https://doi.org/10.1016/j.nxmate.2025.100823

21. Charles Kwame Bandoh, David Adu-Poku, Moro Haruna, Ophelia Pinto, Bernice Yram Danu, Agnes

Tutuwaa, **Eric Selorm Agorku**, Francis Kofi Ampong, Robert Kwame Nkum (2025). The influence of cobalt and graphitic carbon nitride on the efficiency of zirconium oxide for photodegradation of an organic dye in wastewater. *Journal of Chemical Research*. https://doi.org/10.1177/17475198251316376

22. Francis Opoku, **Eric Selorm Agorku**, Samuel Osei-Bonsu Oppong, Edward Ebow Kwaansa-Ansah, Noah Kyame Asare-Donkor, Penny Poomani Govender (2025). Theoretical study on vertical B 2 CSe/Mg(OH) 2 van der Waals heterostructures with high solar-to-hydrogen efficiency. *New Journal of Chemistry*. https://doi.org/10.1039/d5nj00757g

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25. Moro Haruna, Frederick Eshun, Charles Kwame Bandoh, **Eric Selorm Agorku**, Opoku Francis, Noah Kyame Asare–Donkor, Anthony Apeke Adimado (2024). Binary Ce-doped-ZnO/rGO composite as excellent photocatalyst for bromothymol blue dye degradation. *Sustainable Chemistry for the Environment*. https://doi.org/10.1016/j.scenv.2024.100069

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27. Norbert J. Jindor, Leticia P. Amenorfe, Ahmed Kangmennaa, Richard B. Forkuo, Harry Okyere, Nathaniel O. Boadi, Francis Opoku, Anthony A. Adimado, **Eric S. Agorku** (2024). Clay-Loaded Starch-Grafted Chitosan as Environmentally Controlled Release Material for Atrazine. *Applied and Environmental Soil Science*. https://doi.org/10.1155/aess/9985874

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29. **ES Agorku**, RB Voegborlo, PK Karikari (2024). Effects of replacing maize with cassava whey meal in the diets of rabbits. *Ghanaian Journal of Animal Science*. https://www.ajol.info/index.php/gjansci/article/view/282983

30. Bernice Amponsah, Nathaniel Owusu Boadi, Selina Ama Saah, Patrick Opare Sakyi, **Eric Selorm Agorku**, Harry Okyere, Andrew Nyamful (2024). Evaluation of groundwater quality in communities near Sokoban Wood Village. *Heliyon*. https://doi.org/10.1016/j.heliyon.2024.e32757

31. Moro Haruna, Charles Kwame Bandoh, **Eric Selorm Agorku**, Francis Opoku, Noah Kyame Asare–Donkor, Anthony Apeke Adimado (2024). Experimental and ab initio studies of enhance photocatalytic efficiency of La-doped ZnO/g-C3N4 nanocomposites for bromothymol blue dye degradation. *Next Materials*. https://doi.org/10.1016/j.nxmate.2024.100212

32. Charles Kwame Bandoh, Moro Haruna, David Adu-Poku, Bernice Yram Danu, Mandela Toku, Francis Kofi Ampong, Robert Kwame Nkum, **Eric Selorm Agorku** (2024). Gadolinium doped-zirconium oxide-graphitic carbon nitride heterostructures for photocatalytic degradation of eosin yellow dye in water. *Next Materials*. https://doi.org/10.1016/j.nxmate.2024.100424

33. Eugenia Koranteng-Mantey, Charles Kessie, **Eric Selorm Agorku**, Edward Ebow Kwaansa-Ansah, Samuel Osei-Bonsu Oppong, Francis Opoku (2024). Interfacial Electronic States of GeC/g-C3N4 van der Waal Heterostructure with Promising Photocatalytic Activity via Hydrogenation. *ChemPhysChem*. https://doi.org/10.1002/cphc.202300947

34. Ahmed Kangmennaa, Samuel Acquah, Richard Baffour Forkuo, John Kwabena Adusei, George Atiah Atongo, Flora Amerley Amarh, Francis Opoku, **Eric Selorm Agorku** (2024). Methylene blue dye adsorption on Ghana's activated clay from Teleku Bukazo. *Journal of Dispersion Science and Technology*. https://

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35. Flora Amerley Amarh, Ahmed Kangmennaa, **Eric Selorm Agorku**, Ray Bright Voegborlo (2024). Synthesis and Characterization of Magnetic Molecularly Imprinted Polymers for the Adsorption of Chlorpyrifos from Aqueous Media. *Polymer Science Series B*. https://doi.org/10.1134/s1560090424600360

36. Moro Haruna, Charles Kwame Bandoh, **Eric Selorm Agorku**, Francis Opoku, Noah Kyame Asare-Donkor, Anthony Apeke Adimado (2024). Synthesis of La-doped ZrO2/g-C3N4 nanocomposite for eosin yellow photodegradation: A combined experimental and theoretical studies. *Catalysis Communications*. https://doi.org/10.1016/j.catcom.2024.106852

37. Michael Yaw Peasah, Jonathan Awewomom, Richard Osae, **Eric Selorm Agorku** (2024). Trace elements determination and health risk assessment of groundwater sources in Kumasi Metropolis, Ghana. *Environmental Monitoring and Assessment*. https://doi.org/10.1007/s10661-024-13024-z

38. Flora Amerley Amarh, **Eric Selorm Agorku**, Ray Bright Voegborlo, Gerheart Winfred Ashong, George Atiah Atongo (2023). Health risk assessment of some selected heavy metals in infant food sold in Wa, Ghana. *Heliyon*. https://doi.org/10.1016/j.heliyon.2023.e16225

39. Flora Amerley Amarh, **Eric Selorm Agorku**, Ray Bright Voegborlo, Gerheart Winfred Ashong, Enoch Nii Klu Nortey, Napoleon Jackson Mensah (2023). Heavy Metal Content and Health Risk Assessment of Some Selected Medicinal Plants from Obuasi, a Mining Town in Ghana. *Journal of Chemistry*. https://doi.org/10.1155/2023/9928577

40. Moro Haruna, John Kwakye, **Eric Selorm Agorku**, Francis Opoku, Noah Kyame Asare-Donkor, Anthony Apeke Adimado (2023). La–doped ZnO–rGO nanocomposites: Synthesis and characterization as photocatalyst for effective degradation of bromothymol blue dye in water. *Results in Materials*. https://doi.org/10.1016/j.rinma.2023.100449

41. Ahmed Kangmennaa, Henritta Yakubu, Agnes Tutuwaa, Charity Ohemaa Agyapong, Mandela Toku, **Eric Selorm Agorku** (2023). Methylene blue adsorption on vanadium pentoxide nanorods dispersed in starch-grafted polyacrylonitrile. *International Journal of Polymer Analysis and Characterization*. https://doi.org/10.1080/1023666x.2023.2274661

42. Jonah Wuloh, **Eric Selorm Agorku**, Nathaniel Owusu Boadi (2023). Modification of Metal Oxide Semiconductor Gas Sensors Using Conducting Polymer Materials. *Journal of Sensors*. https://doi.org/10.1155/2023/7427986

43. **Eric S. Agorku**, Ahmed Kangmennaa, Moro Haruna, Francis Opoku (2023). Photocatalytic activity of red emission PVA-GdVO 4 :Eu 3+ nanocomposite towards the degradation of Eosin Y in water. *Sustainable Environment*. https://doi.org/10.1080/27658511.2023.2266632

44. Nobert J. Jindor, **Eric S. Agorku**, Anthony A. Adimado (2023). Starch-Grafted Sodium Alginate-Modified Clay Composites as Environmentally Controlled-Release Materials for NPK Fertilizer. *Applied and Environmental Soil Science*. https://doi.org/10.1155/2023/5133023

45. Charles Kwame Bandoh, Bernice Yram Danu, **Eric Selorm Agorku**, Francis Kofi Ampong, Robert Kwame Nkum (2023). The effect of cobalt-doped ZnO-g-C3N4 heterostructures on photocatalytic degradation of eosin yellow dye in water under simulated solar light. *Results in Materials*. https://doi.org/10.1016/j.rinma.2023.100515

46. John Kwabena Adusei, **Eric Selorm Agorku**, Ray Bright Voegborlo, Francis Kofi Ampong, Emmanuel Awarikabey, Bernice Yram Danu, Flora Amerley Amarh (2023). Zero Valent Iron Impregnated Sodium Alginate Grafted (Acrylamide-Co-Acrylic Acid) Adsorbents for the Removal of Methylene Blue in Aqueous Systems. *Journal of Macromolecular Science Part B*. https://doi.org/10.1080/00222348.2023.2211376

47. **ES Agorku**, FK Ampong (2022). Graphitic Carbon Nitride Based Composites as Advanced Photocatalysts, from Synthesis to Application: A Review. *Res. Rev.: J. Mater. Sci*. https://www.academia.edu/download/89748551/graphitic_carbon_nitride_based_composites_as_advancedphotocatalysts_from_synthesis_to_application_a_review.pdf

48. Leticia P. Amenorfe, **Eric S. Agorku**, Frederick Sarpong, Ray B. Voegborlo (2022). Innovative exploration of additive incorporated biopolymer-based composites. *Scientific African*. https://doi.org/10.1016/j.sciaf.2022.e01359

49. Emmanuel Awarikabey, Mark Brako Frempong Berko, Emmanuela KwaoBoateng, Martin Yeboah Woode, Andrew Nyamful, Eric Enzula Bayari, **Eric Selorm Agorku** (2022). Mass Balance and Quality Assessment of Potash from Cocoa Husk Ash from Ghana. *International Journal of Science and Research (IJSR)*. https://doi.org/10.21275/sr22326004515

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51. Bernice Y. Danu, **Eric S. Agorku**, Francis K. Ampong, Johannes A.M. Awudza, Bismark Owusu, Patrick N.O. Brown, Onoyivwe M. Ama, Peter O. Osifo, Suprakas S. Ray (2021). Chitosan-Graft-Sodium Alginate Encapsulated Vanadium Pentoxide (V2 O5 ) Nanocomposite for Adsorption and Antimicrobial Studies. *Journal of Advanced Materials Science and Engineering*. https://doi.org/10.33425/2771-666x.1006

52. Flora Amarh, Ray Bright Voegborlo, Edward Ken Essuman, **Eric Selorm Agorku**, Clement Okraku Tettey, Nii Korley Kortei (2021). Effects of soil depth and characteristics on phosphorus adsorption isotherms of different land utilization types. *Soil and Tillage Research*. https://doi.org/10.1016/j.still.2021.105139

53. B. Y. Danu, **E. S. Agorku**, F. K. Ampong, J. A. M. Awudza, V. Torve, I. M. K. Danquah, O. M. Ama, P. O. Osifo, S. S. Ray (2021). Iron Sulfide Functionalized Polyaniline Nanocomposite for the Removal of Eosin Y from Water: Equilibrium and Kinetic Studies. *Polymer Science Series B*. https://doi.org/10.1134/s1560090421030040

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55. **ES Agorku** (2020). Sulfur/Gadolinium-Codoped TiO2 Nanoparticles for Enhanced Visible-Light Photocatalytic Performance (vol 2014, 289150, 2014). *JOURNAL OF NANOMATERIALS*. https://scholar.google.com/scholar?cluster=8820614888143696073&hl=en&oi=scholarr

56. **ES Agorku** (2016). Alternative method for qualitative analysis of specific non-volatile organic compounds present in South African water systems. *South African Journal of Chemistry*. https://www.scielo.org.za/scielo.php?pid=S0379-43502016000100033&script=sci_arttext

57. William Wilson Anku, Samuel Osei-Bonsu Oppong, Sudheesh Kumar Shukla, **Eric Selorm Agorku**, Penny Poomani Govender (2016). Chitosan–sodium alginate encapsulated Co-doped ZrO2–MWCNTs nanocomposites for photocatalytic decolorization of organic dyes. *Research on Chemical Intermediates*. https://doi.org/10.1007/s11164-016-2532-9

58. William Wilson Anku, Samuel Osei-Bonsu Oppong, Sudheesh Kumar Shukla, **Eric Selorm Agorku**, Poomani Penny Govender (2016). Cobalt doped ZrO2 decorated multiwalled carbon nanotube: A promising nanocatalyst for photodegradation of indigo carmine and eosin Y dyes. *Progress in Natural Science Materials International*. https://doi.org/10.1016/j.pnsc.2016.06.007

59. **Eric Selorm Agorku**, Edward Ebow Kwaansa-Ansah, Ray Bright Voegborlo, Pamela Amegbletor, Francis Opoku (2016). Mercury and hydroquinone content of skin toning creams and cosmetic soaps, and the potential risks to the health of Ghanaian women. *SpringerPlus*. https://doi.org/10.1186/s40064-016-1967-1

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(2016). Photocatalytic degradation of indigo carmine using Nd-doped TiO2-decorated graphene oxide nanocomposites. *Journal of Sol-Gel Science and Technology*. https://doi.org/10.1007/s10971-016-4062-8

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65. **E.S. Agorku**, A.T. Kuvarega, B.B. Mamba, A.C. Pandey, A.K. Mishra (2015). Enhanced visible-light photocatalytic activity of multi-elements-doped ZrO2 for degradation of indigo carmine. *Journal of Rare Earths*. https://doi.org/10.1016/s1002-0721(14)60447-6

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