



KOHOBHANGE S. P. KARUNADASA

Research Scientist

Materials Technology Section

Qualifications

B.Sc. (Hons) Special in Chemistry (University of Peradeniya), **Ph.D. (Reading)**, **M. I. Chem. C.**

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Specialized Fields

Chemistry (Electrochemistry), X-ray Diffraction, Materials Science, Nanotechnology

Interest Areas

Materials Science, Mineral processing & Metal extraction, Electrochemistry, X-ray Diffraction, Nanotechnology, Energy Storage Devices, Fuel Cells, Green Synthesis

Publications

Publications

1. R. M. Gamini Rajapakse, **Kohobhange S. P. Karunadasa**. 2026. From hydration history to molten-state performance: structure–stability relationships of calcium chloride across solid–liquid–electrochemical regimes. *Chem. Pap.* <https://doi.org/10.1007/s11696-026-05206-5>
2. W. D. Chandana, **Kohobhange S. P. Karunadasa**, C. Manoratne, R. M. G. Rajapakse. 2025 Enhanced electroanalytical and energy storage performance via synergetic matrix of graphite-MMT composite electrode enriched with tin oxide as an electrochemically supportive mediator, *Ceylon Journal of Science*, 54.
3. D.J.D.S. Gamage, **Kohobhange S. P. Karunadasa**, P. M. H. Madhushanka. 2025. A synergetic graphite-(Ce-montmorillonite) binary composite electrode contains cerium (IV) ions as a supportive electroactive mediator for improved electroanalytical and energy storage applications, *Chem. Pap.*, <https://doi.org/10.1007/s11696-025-04342-8>
4. P. M. H. Madhushanka, **Kohobhange S. P. Karunadasa**. 2025. Graphite Composite Electrodes for Effective Charge Storage via Synergistically Improved Compositions Enriched with Kaolinite and Cement as Matrix Inducers, *Advanced Energy Conversion Materials*. 6(1): 83-101
5. P. M. H. Madhushanka, **Kohobhange S. P. Karunadasa**, DJDS Gamage. 2024. Advancement of Graphite-Clay Composite Electrodes via Different Compositions to Improve the Synergetic Matrix Effect Towards General Electroanalytical and Energy Storage Applications, *Advanced Energy Conversion Materials*. 5(2): 281-307
6. **Kohobhange S. P. Karunadasa** 2024. Structure-stability correlations in terms of microstructure during tin oxidation as examined by in situ high-temperature X-ray powder diffraction, *Chemical Papers* 78(6): 3617-3628
7. P. M. H. Madhushanka, **Kohobhange S. P. Karunadasa**, R. M. Gamini Rajapakse 2024. Graphite-colloidal graphite–kaolinite-cement quaternary composite electrode with improved synergetic matrix effect towards efficient energy storage and electroanalytical applications, *Chemical Papers*. 1-14

8. **Kohobhange S. P. Karunadasa**, P. M. H. Madhushanka, C. H. Manoratne 2024. Low-cost ternary composite photocatalysts consisting of TiO₂, kaolinite and cement for an efficient organic waste decontamination in water, *Journal of Polymer Science and Engineering* 7(1): 4510
9. **Kohobhange S. P. Karunadasa**, A. S. K. Wijekoon, C. H. Manoratne. 2024. TiO₂-kaolinite composite photocatalyst for industrial organic waste decontamination, *Next Materials*, 3 (2024) 100065.
10. P. M. H. Madhushanka, **Kohobhange S. P. Karunadasa**, R. M. Gamini Rajapakse, C. H. Manoratne, H. M. N. Bandara. 2024. Low-cost composite electrode consisting of graphite, colloidal graphite and montmorillonite with enhanced electrochemical performance for general electroanalytical techniques and device fabrication, *Chemical Papers*.
11. P. P. B. Gunarathne, **Kohobhange S. P. Karunadasa**. 2023. Low-cost heterogeneous composite photocatalyst consisting of TiO₂, kaolinite and MMT with improved mechanical strength and photocatalytic activity for industrial wastewater treatment, *Insight-Mechanics*, 6
12. **Kohobhange S. P. Karunadasa**, R.M.G. Rajapakse, H.M.T.G.A. Pitawala, C.H. Manoratne. 2023. Microstructural insight into the thermal decomposition of MgCl₂·6H₂O examined by in-situ high-temperature X-ray powder diffraction, *Journal of Solid State Chemistry* 322: 123965.
13. D. T. Rathnayake, **Kohobhange S. P. Karunadasa**, A. S. K. Wijekoon, C. H. Manoratne, R. M. G. Rajapakse, H. M. T. G. A. Pitawala. 2023. Polyaniline-conjugated graphite-montmorillonite composite electrode prepared by in situ electropolymerization for supercapacitor applications. *Chem. Pap*, <https://doi.org/10.1007/s11696-022-02646-7>
14. **Kohobhange S. P. Karunadasa**, C. H. Manoratne 2022. Microstructural view of anatase to rutile phase transformation examined by in-situ high-temperature X-ray powder diffraction, *Journal of Solid State Chemistry*. 314: 123377.
15. D. T. Rathnayake, **Kohobhange S. P. Karunadasa**, A. S. K. Wijekoon, C. H. Manoratne, R. M. G. Rajapakse. 2022. Low-cost ternary composite of graphite, kaolinite and cement as a potential working electrode for general electrochemical applications. *Chem. Pap*. <https://doi.org/10.1007/s11696-022-02314-w>
16. **Kohobhange S. P. Karunadasa**, C. H. Manoratne, H. M. T. G. A. Pitawala, R. M. G. Rajapakse 2021. A binder-free composite of graphite and kaolinite as a stable working electrode for general electrochemical applications. *Electrochem Sci Adv*. 2021;e5100003 (doi.org/10.1002/elsa.202100003)
17. **Kohobhange S. P. Karunadasa**, C. H. Manoratne, H. M. T. G. A. Pitawala, R. M. G. Rajapakse 2019. A potential working electrode based on graphite and montmorillonite for electrochemical applications in both aqueous and molten salt electrolytes. *Electrochemistry Communications*. 108: 106562.
18. **Kohobhange S. P. Karunadasa**, C. H. Manoratne, H. M. T. G. A. Pitawala and R. M. G. Rajapakse 2019. Thermal decomposition of calcium carbonate (calcite polymorph) as examined by in-situ high-temperature X-ray powder diffraction. *J. Phys. Chem. Solids*. 134: 21-28.
19. **Kohobhange S. P. Karunadasa**, C. H. Manoratne, H. M. .G. A. Pitawala and R. M. G. Rajapakse 2018. The effect of prolonged milling time on comminution of quartz. *Powder Technol*. 330: 266-274.

20. **Kohobhange S. P. Karunadasa**, C. H. Manaratne, H. M. T. G. A. Pitawala and R. M. G. Rajapakse 2018. The composition, unit cell parameters and microstructure of quartz during phase transformation from α to β as examined by in-situ high-temperature X-ray powder diffraction. *J. Phys. Chem. Solids*. 117: 131-138.
21. **Kohobhange S. . Karunadasa**, C. H. Manaratne, H. M. T. G. A. Pitawala and R. M. G. Rajapakse 2018. Relative stability of hydrated/anhydrous products of calcium chloride during complete dehydration as examined by high-temperature X-ray powder diffraction. *J. Phys. Chem. Solids*. 120: 167-172.
22. **Kohobhange S. P. Karunadasa** 2018. Dehydration of calcium chloride as examined by high-temperature X-ray powder diffraction. Third Asia-Pacific Conference on Multidisciplinary Research 2018. 33-40
23. I.R.M. Kottegoda, H. C. D. P. Colombage, **Kohobhange S. P. Karunadasa**, D.S. Samarawickrama, C. H. Manaratne 2013. An efficient Reactor for Purification of Domestic Water Using Solar Energy, *International Journal of Energy Engineering*. 3 (3): 93-98

COMMUNICATIONS (International)

1. Rathnayake, D. T., Tharangani, L. W. N., **Kohobhange S. P. Karunadasa.**, Manaratne, C. H. (2019). Mechanically compressed graphite-clay composite electrode for high-temperature applications, International Research conference Uva-Wellassa University (IRC UWU), Badulla, Sri Lanka, 7-9 February. pp. 456
2. Tharangani, L. W. N., Rathnayake, D. T., **Kohobhange S. P. Karunadasa.**, Manaratne, C. H. (2019). The incorporation of layered type clay in graphite-clay based electrodes as a property enhancement for high-temperature applications, International Research conference Uva-Wellassa University (IRC UWU), Badulla, Sri Lanka, 7-9 February. pp. 445
3. Mahanama, M. G. G. C., **Kohobhange S. P. Karunadasa.**, Manaratne, C. H. (2018). A composite electrode for high-temperature application as a value addition to local graphite and kaolinite, Wayamba University International Conference (Win C). Kuliyaipitiya, Sri Lanka, 24-25 August. pp. 16
4. **Kohobhange S. P. Karunadasa.**, Manaratne, C. H., Pitawala, H. M. T. G. A., Rajapakse, R. M. G. (2018). Dehydration of calcium chloride as examined by high-temperature X-ray powder diffraction. Asia-Pacific Conference on Multidisciplinary Research, 3, Colombo, Sri Lanka, 06-07 July. pp. 18
5. **Kohobhange S. P. Karunadasa.**, Manaratne, C. H., Pitawala, H. M. T. G. A., Rajapakse, R. M. G. (2017). The phase transformation of quartz from α to β as examined by in-situ high temperature X-ray diffraction, Asia-Pacific Conference on Multidisciplinary Research, 2, Colombo, Sri Lanka. pp. 49

COMMUNICATIONS (Local)

1. WD Chandana, **Kohobhange S. P. Karunadasa**, CH Manaratne, RMG Rajapakse (2025). Aniline electropolymerization on a graphite, tin oxide, and montmorillonite composite electrode and an electrochemical analysis of its capacitive characteristics, 2nd International/7th Biennial Symposium of ITI, ITI, Colombo 7, Sri Lanka.
2. R.K.D.A. Neranjani, **Kohobhange S. P. Karunadasa**, P.M.H. Madhushanka, CH Manaratne (2025). Fabrication of different types of supercapacitors using graphite-kaolinite-based electrodes, 2nd International/7th Biennial Symposium of ITI, ITI, Colombo 7, Sri Lanka.

3. P.M.H. Madhushanka, **Kohobhange S. P. Karunadasa**, C.H. Manaratne (2025). Incorporation of Ce (IV) into graphite-clay composite matrix in electrodes to improve the performance of supercapacitor applications, 2nd International/7th Biennial Symposium of ITI, ITI, Colombo 7, Sri Lanka.
4. M.A.B. Madhubhashini, **Kohobhange S. P. Karunadasa**, P.M.H. Madhushanka, CH Manaratne (2025). Graphite-cerium intercalated-montmorillonite-cement-biochar composite electrode with a synergetic matrix for energy storage applications by incorporating cerium as an electroactive mediator, 2nd International/7th Biennial Symposium of ITI, ITI, Colombo 7, Sri Lanka.
5. P.M.H. Madhushanka, **Kohobhange S. P. Karunadasa**, R.M. Gamini Rajapakse, C.H. Manaratne, (2023). Polyaniline conjugated graphite-clay composite electrodes fabricated by electro- polymerization for supercapacitor applications, 6th Biennial Symposium of ITI, ITI, Colombo 7, Sri Lanka.
6. **Kohobhange S. P. Karunadasa**., Manaratne, C.H. Pitawala, H.M.T.G.A., Rajapakse, R.M.G. (2019). Property enhancement of calcium chloride by synthesizing stable ternary eutectic electrolyte for molten salt electrochemical applications, *Biennial Symposium of ITI*, ITI, Colombo 7, Sri Lanka, 17-18 December. pp. 28
7. D.T. Rathnayake, **Kohobhange S. P. Karunadasa**, C.H. Manaratne, (2021). A competitive composite electrode consisting of graphite and clay for electroanalytical applications, 5th Biennial Symposium of ITI, ITI, Colombo 7, Sri Lanka.

PATENTS

1. **Kohobhange S. P. Karunadasa**, C. H. Manaratne, (Industrial Technology Institute), 2020. A stable composite electrode based on graphite and clay for high-temperature and general electrochemical applications, Sri Lanka Patent. 20844.
2. **Kohobhange S. P. Karunadasa**, H.D.D.P. Gunasekara H.A.M.I.T. Hettiarachchi, W.R.L. Wijesekara, I.R.M. Kottegoda (Industrial Technology Institute) 2018. Fabrication of photo-catalytic continuous flow reactor using plastic pipes for decontamination of organic waste. Sri Lanka Patent. 18851
3. I.R.M. Kottegoda, **Kohobhange S. P. Karunadasa**, H.A.M.I.T. Hettiarachchi, H.D.D.P. Gunasekara (Industrial Technology Institute) 2013. Immobilization of TiO₂ on a substrate using polymer/binder/adhesive for photo-catalytic air/water purification system, Sri Lanka Patent. 17486

AWARDS

1. “**Dasis Award**” for the most outstanding Invention (A stable composite electrode based on graphite and clay for high-temperature and general electrochemical applications) at Sahasak Nimavum 2024, National Exhibition for Inventions & Innovations organized by Sri Lanka Inventors Commission.
2. “**Gold Medal**” for the most outstanding Invention (A stable composite electrode based on graphite and clay for high-temperature and general electrochemical applications) at Sahasak Nimavum 2024, National Exhibition for Inventions & Innovations organized by Sri Lanka Inventors Commission.

	3. Best Innovation Award (Chemical Category), Industry-Expo 2025 Exhibition, 2025 4. NRC Merit Awards for Scientific Research, 2024 5. Achievement Award for “In recognition of award winning Academic and scientific Excellence” (7th Biennial Research Symposium, 2025) 6. Achievement Award for “Best Innovative Project 2023”, (6th Biennial Research Symposium, 2023) 7. Achievement Award for “In recognition of award winning Academic and scientific Excellence” (6th Biennial Research Symposium, 2023) 8. Achievement Award for “Best Innovative Project 2021”, (5th Biennial Research Symposium, 2021) 9. Achievement Award for “In recognition of award winning Academic and scientific Excellence” (5th Biennial Research Symposium, 2021) 10. Achievement Award for “In recognition of award winning Academic and scientific Excellence” (4th Biennial Research Symposium, 2019)
Major Projects Undertaken	1. Conversion of readily available Sri Lankan natural quartz to solar grade silicon for applications in electronic industries (TG 24/245) 2. A low-cost electrode modified by controlled synthesis of nanofiber network of homo/copolymer of aniline and pyrrole on graphite-clay composite substrate for supercapacitor applications (TG 21/193) 3. Performance enhancement of binary graphite-clay composite electrodes via fabricating quaternary composites with better surface characteristics for the development of supercapacitors and sensors (TG 24/246) 4. A stable composite based on titanium dioxide and clay as an effective photocatalyst for wastewater treatment (NRC 20-014) 5. Fabrication of low cost graphite-based composite electrode for electrochemical applications at high-temperature as a value addition to local minerals (TG 19/181)