

List of publications in SCI Journals

National

1. Sethi, C., **Hazra, B.**, Boral, P. and Kumar, S., 2025. Insights from Optical-Electron Correlative Microscopy on Shales Subjected to Underground Thermal Treatment. *Journal of the Geological Society of India*, 101(5), pp.714-716.
2. Mishra, K., Behera, S.K., Patel, S.K., Singh, P., Buragohain, J., **Hazra, B.**, Mandal, S.K. and Kumar, R., 2024. Experimental Investigation on the Mechanical and Microstructural Properties of Cemented Coal Ash Based Paste Backfill Reinforced with Polypropylene Fibre. *Indian Geotechnical Journal*, pp.1-15.
3. **Hazra, B.***, Singh, P.K., Sethi, C. and Pandey, J.K., 2024. Application of Optical-electron Correlative Microscopy for Characterization of Organic Matter. *Journal Of The Geological Society Of India*, 100(10), pp.1385-1394.
4. Chakraborty, P., Singh, S. and **Hazra, B.***, 2023. Soil pollution in Indian coal mines, available remediation techniques and rock dust application: A review. *Journal of Earth System Science*, 132(3), p.147.
5. Mishra, S., Peketi, A., **Hazra, B.**, Da Silva, R. and Mazumdar, A., 2023. Nature and hydrocarbon potential of organic matter in offshore Mahanadi Basin, east coast of India. *Journal of Earth System Science*, 132(3), p.108.
6. **Hazra, B.***, Singh, D.P., Chakraborty, P. *et al.*, 2022. Structural and thermal properties of vitrain lithotype in coal-inferences from TG-DTG-DSC, Rock-Eval and X-ray diffraction. *Journal of Earth System Science*, **131**, 98.
7. Varma, A.K., Mishra, S., Tiwari, B., **Hazra, B.**, Kumar, S., Panigrahi, D.C. and Ojha, A., 2019. Petrographic controls on phosphorous distribution in coal seams of the Jharia basin, India. *Journal of Earth System Science*, 128(4), p.103.
8. Kumari, P., Singh, A.K., Wood, D., **Hazra, B.***, 2019. Predictions of gross calorific value of Indian coals from their moisture and ash content. *Journal of Geological Society of India*. Volume 93, Pages 437-442.
9. Varma, A.K., Khatun, M., Mendhe, V.A., **Hazra, B.**, Singh, B.D., Dayal, A.M. Petrographic characterization and Langmuir volume of shales from Raniganj coal basin, India. *Journal of Geological Society of India*. Volume 86 (3), 2015, Pages 283-294.
10. Sethi, C., **Hazra, B.***, Wood, D.A. and Singh, A.K., 2023. Experimental protocols to determine reliable organic geochemistry and geomechanical screening criteria for shales. *Journal of Earth System Science*, 132(2), p.45.

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International

1. Chowdhury, M., Sarkar, K., **Hazra, B.***, Sadeghpour, F., Panda, M., Vishal, V. and Ostadhassan, M., 2025. Effects of Rapid Thermal Exposure from Igneous Intrusions on the Pore Structure, Thermal Maturity, and Nanomechanical Properties of Coal and Shale. *Energy & Fuels*.
2. Kumar, A., Mustapha, K.A., Singh, V.P., **Hazra, B.**, Gopinathan, P. and Mathews, R.P., 2025. Paleodepositional environment and source rock potential of Paleogene

lignite and shale horizons in the Saurashtra Basin, Western India. *International Journal of Coal Science & Technology*, 12(1), pp.1-20.

3. Chakraborty, P., Singh, S., Wood, D.A., **Hazra, B.**, Kumar, P. and Kumar, P.V., 2025. Spatio-temporal variation, integrated quantification of source attribution, and health risk assessment of metal trace element contamination in coal mining soils of the Eastern Raniganj basin, India. *Journal of Environmental Chemical Engineering*, 13(3), p.116567.
4. Sadeghpour, F., Motra, H.B., Sethi, C., Wind, S., **Hazra, B.**, Aghli, G. and Ostadhassan, M., 2025. Elastic properties of anisotropic rocks using an stepwise loading framework in a true triaxial testing apparatus. *Geoenergy Science and Engineering*, 251, p.213883.
5. Sethi, C., Motra, H.B., **Hazra, B.*** and Ostadhassan, M., 2025. Influence of lithological contrast on elastic anisotropy of shales under true-triaxial stress and thermal conditions. *International Journal of Rock Mechanics and Mining Sciences*, 190, p.106100.
6. Kumar, S., Chandra, D., **Hazra, B.**, Vishal, V., Ranjith, P.G., Das, A., Ahuja, M. and Ghosh, S., 2025. Integration of fluid-invasive, scattering, and imaging methods in resolving pore structures in coal and shale. *Fuel*, 395, p.135185.
7. **Hazra, B.***, Motra, H.B., Hower, J.C., Mastalerz, M., Sethi, C. and Schobert, H., 2025. Elastic anisotropy and deformation characteristics of Pennsylvania anthracite. *International Journal of Coal Geology*, 303, p.104740.
8. Ghosh Dastidar, S., Sarkar, K., Chandra, D., **Hazra, B.** and Vishal, V., 2025. Investigating Pore Characteristics and Their Dependence on Shale Composition: Case Study from a Permian Basin in India. *ACS Omega*.
9. Sennaoui, B., Ling, K., Ostadhassan, M., Delshad, M., **Hazra, B.** and Fatah, A., 2025. Subsurface CO₂ Storage in Unconventional Reservoirs: Insights into Pore-Scale Characterization of Geochemical Interactions and Particle Migration. *Geoenergy Science and Engineering*, p.213688.
10. Kar, N.R., Mani, D., Buragohain, J., **Hazra, B.**, Babu, E.V.S.S.K., Seetha, B.S., Mudiam, M.K.R. and Maurya, A.S., 2025. Source Rock Properties, Depositional Environment and Kerogen Degradation Kinetics of Lower Permian Shales from the Ib River Sub-Basin, Mahanadi Basin, Eastern India. *Journal of Petroleum Geology*.
11. **Hazra, B.**, Wood, D.A., Panda, M., Sethi, C., Vishal, V., Chandra, D. and Ostadhassan, M., 2025. Pore Structural Complexities and Gas Storage Capacity of Indian Coals with Various Thermal Maturities. *Energy & Fuels*.
12. Liu, X., Huang, Y., Babaei, S., **Hazra, B.** and Ostadhassan, M., 2024. Experimental and molecular simulation of carbon dioxide solubility in hexadecane at varying pressures and temperatures. *Chemical Engineering Journal*, p.157721.
13. Rahman, T., **Hazra, B.** and Vishal, V., 2025. Pore structure evolution of Jharia coal for potential underground coal thermal treatment and associated CO₂ sequestration. *Fuel*, 381, p.133577.
14. Chakraborty, P., Singh, S., **Hazra, B.**, Majumdar, A.S. and Kumari, J., 2024. Spatial distribution, source apportionment, and health risks assessment of trace elements in

pre-and post-monsoon soils in the coal-mining region of North Karanpura basin, India. *Science of The Total Environment*, 955, p.177173.

15. **Hazra, B.***, Chandra, D., Vishal, V., Ostadhassan, M., Sethi, C., Saikia, B.K., Pandey, J.K. and Varma, A.K., 2024. Experimental study on pore structure evolution of thermally treated shales: implications for CO₂ storage in underground thermally treated shale horizons. *International Journal of Coal Science & Technology*, 11(1), p.61.
16. Abdi-Khanghah, M., Wu, K.C., Soleimani, A., **Hazra, B.** and Ostadhassan, M., 2024. Experimental investigation, non-isothermal kinetic study and optimization of oil shale pyrolysis using two-step reaction network: Maximization of shale oil and shale gas production. *Fuel*, 371, p.131828.
17. Safaei-Farouji, M., Sethi, C., **Hazra, B.**, Gao, Y., Fattahi, E., Vishal, V., Pandey, J.K. and Ostadhassan, M., 2024. CO₂ Storage Potential of Coaly Shales of the Barakar Formation in the Rajmahal Basin, India. *Energy & Fuels*.
18. Adsul, T., O'Beirne, M.D., Fike, D.A., Ghosh, S., Werne, J.P., Gilhooly III, W.P., Hackley, P.C., Hatcherian, J.J., Philip, B., **Hazra, B.** and Bhattacharyya, S., 2024. Decoding paleomire conditions of paleogene superhigh-organic-sulfur coals. *International Journal of Coal Geology*, p.104559.
19. Wang, C., Liu, B., Mohammadi, M.R., Fu, L., Fattahi, E., Motra, H.B., **Hazra, B.**, Hemmati-Sarapardeh, A. and Ostadhassan, M., 2024. Integrating experimental study and intelligent modeling of pore evolution in the Bakken during simulated thermal progression for CO₂ storage goals. *Applied Energy*, 359, p.122693.
20. Sethi, C., **Hazra, B.***, Ostadhassan, M., Motra, H.B., Dutta, A., Pandey, J.K. and Kumar, S., 2024. Depositional environmental controls on mechanical stratigraphy of Barakar Shales in Rajmahal Basin, India. *International Journal of Coal Geology*, p.104477.
21. Kumar, S., Chandra, D., **Hazra, B.**, Vishal, V. and Pathegama Gamage, R., 2024. Nanopore Characteristics of Barakar Formation Shales and Their Impact on the Gas Storage Potential of Korba and Raniganj Basins in India. *Energy & Fuels*.
22. Aggarwal, N., Mishra, D. and **Hazra, B.**, 2024. Study on sequence stratigraphy in the Permian sediments of terrestrial sequences within the Chintalapudi sub-basin, Godavari Coalfield, Southern India: insight from palynology and geochemistry. *Environmental Earth Sciences*, 83(8), p.233.
23. Karan, K.K., Masto, R.E., Agarwalla, H., Bari, S., Kumar, M., Gopinathan, P., **Hazra, B.**, Saha, S. and Maity, S., 2024. Separation of coal combustion residue for critical element extraction and other bulk uses. *Environmental Science: Advances*, 3(1), pp.109-118.
24. **Hazra, B.**, Chandra, D., Lahiri, S., Vishal, V., Sethi, C. and Pandey, J.K., 2023. Pore Evolution during Combustion of Distinct Thermally Mature Shales: Insights into Potential In Situ Conversion. *Energy & Fuels*, 37(18), pp.13898-13911.
25. Bhapkar, P.V., Pradhan, S.P., Chandra, D., **Hazra, B.** and Vishal, V., 2023. Systematic Pore Characterization of Sub-Bituminous Coal from Sohagpur Coalfield, Central India Using Gas Adsorption Coupled with X-ray Scattering and High-Resolution Imaging. *Energy & Fuels*.

26. Sethi, C., Mastalerz, M., Hower, J.C., **Hazra, B.***, Singh, A.K. and Vishal, V., 2023. Using optical-electron correlative microscopy for shales of contrasting thermal maturity. *International Journal of Coal Geology*, p.104273.
27. Chakraborty, P., Wood, D.A., Singh, S. and **Hazra, B.**, 2023. Trace element contamination in soils surrounding the open-cast coal mines of eastern Raniganj basin, India. *Environmental Geochemistry and Health*, pp.1-28.
28. Chandra, D., Bakshi, T., Bahadur, J., **Hazra, B.**, Vishal, V., Kumar, S., Sen, D. and Singh, T.N., 2023. Pore morphology in thermally-treated shales and its implication on CO₂ storage applications: A gas sorption, SEM, and small-angle scattering study. *Fuel*, 331, p.125877.
29. **Hazra, B.***, Wood, D.A., Chakraborty, P., Singh, D.P., Sahu, S.G. and Sarkar, P., 2022. Comparative thermal behavior, Rock-Eval signature and kinetics of distinct thermally mature vitrain, fusain lithotypes and coals from India. *International Journal of Coal Preparation and Utilization*, pp.1-23.
30. **Hazra, B.**, Vishal, V., Sethi, C. and Chandra, D., 2022. Impact of Supercritical CO₂ on Shale Reservoirs and Its Implication for CO₂ Sequestration. *Energy & Fuels*, 36, 17, 9882–9903.
<https://doi.org/10.1021/acs.energyfuels.2c01894>
31. **Hazra, B.***, Katz, B.J., Singh, D.P., Singh, P.K., 2022. Impact of siderite on Rock-Eval S3 and Oxygen Index. *Marine and Petroleum Geology*, 143, 105804.
32. Singh, D.P., Wood, D.A., Singh, V., **Hazra, B.***, Singh, P.K., 2022. Impact of Particle Crush-Size and Weight on Rock-Eval S2, S4, and Kinetics of Shales. *Journal of Earth Science*, 33(2): 513–524.
33. Chandra, D., Vishal, V., Bahadur, J., Agrawal, A.K., Das, A., **Hazra, B.**, Sen, D., 2022. Nano-scale physicochemical attributes and their impact on pore heterogeneity in shale. *Fuel*, 123070.
34. Singh, D.P., **Hazra, B.***, Wood, D.A. and Singh, P.K., 2021. Hydrocarbon generation and kinetics: A case study of Permian shales, India. *Journal of Asian Earth Sciences*, 222, p.104960.
35. Singh, D.P., Chandra, D., Vishal, V., **Hazra, B.**, and Sarkar, P., 2021. Impact of degassing time and temperature on the estimation of pore attributes in shale. *Energy & Fuels*, 35(19), pp.15628-15641.
36. Singh, D.P., Wood, D.A., **Hazra, B.***, and Singh, P.K., 2021. Pore Properties in Organic-Rich Shales Derived Using Multiple Fractal Determination Models Applied to Two Indian Permian Basins. *Energy & Fuels*, 35(18), pp.14618-14633.
37. Chakraborty, P., **Hazra, B.***, Sarkar, P., Singh, A.K., Singh, P.K. and Kumar, S., 2021. Thermal behavior of some Indian coals: inferences from simultaneous thermogravimetry–calorimetry and rock–eval. *Natural Resources Research*, 30(3), pp.2161-2177.
38. **Hazra, B.***, Singh, D.P., Chakraborty, P., Singh, P.K., Sahu, S.G. and Adak, A.K., 2021. Using rock-eval S4Tpeak as thermal maturity proxy for shales. *Marine and Petroleum Geology*, 127, p.104977.

39. **Hazra, B.***, Singh, D.P., Crosdale, P.J., Singh, V., Singh, P.K., Gangopadhyay, M. and Chakraborty, P., 2021. Critical insights from Rock-Eval analysis of vitrains. *International Journal of Coal Geology*, 238, p.103717.
40. **Hazra, B.**, Vishal, V. and Singh, D.P., 2020. Applicability of low-pressure CO₂ and N₂ adsorption in determining pore attributes of organic-rich shales and coals. *Energy & Fuels*, 35(1), pp.456-464.
41. Raghuvanshi, G., Chakraborty, P., **Hazra, B.***, Adak, A.K., Singh, P.K., Singh, A.K. and Singh, V., 2020. Pyrolysis and combustion behavior of few high-ash Indian coals. *International Journal of Coal Preparation and Utilization*, pp.1-21.
42. **Hazra, B.***, Singh, A.K., Singh, P.K., Mani, D., Boral, P., Das, M., 2019. Hydrocarbon-generation potential and thermal maturity of few Indian coals: inferences from organo-petrography and Rock-Eval. *Energy Sources, Part A: Recovery, Utilization, and Environmental Effects*. <https://doi.org/10.1080/15567036.2019.1695981>
43. **Hazra, B.***, Karacan, C.Ö., Mani, D., Singh, P.K., Singh, A.K., 2019. Insights from Rock-Eval analysis on the influence of sample weight on hydrocarbon generation from Lower Permian organic matter rich rocks, West Bokaro basin, India. *Marine and Petroleum Geology*. Volume 106, Pages 160-170.
44. **Hazra, B.***, Chandra, D., Singh, A.K., Varma, A.K., Mani, D., Singh, P.K., Boral, P., Buragohain, J., 2019. Comparative pore structural attributes and fractal dimensions of Lower Permian organic-matter-bearing sediments of two Indian basins: Inferences from nitrogen gas adsorption. *Energy Sources, Part A: Recovery, Utilization, and Environmental Effects*. <https://doi.org/10.1080/15567036.2019.1582737>
45. Vishal, V., Chandra, D., Bahadur, J., Sen, D., **Hazra, B.**, Mahanta, B., Tiwari, D.M., 2019. Interpreting Pore Dimensions in Gas Shales Using a Combination of SEM Imaging, Small-Angle Neutron Scattering, and Low-Pressure Gas Adsorption. *Energy and Fuels*, 33, 6, 4835-4848.
46. Misra, S., Varma, A. K., **Hazra, B.**, Biswas, S., & Samad, S. K., 2019. The influence of the thermal aureole asymmetry on hydrocarbon generative potential of coal beds: Insights from Raniganj Basin, West Bengal, India. *International Journal of Coal Geology*. Volume 206, Pages 91-105.
47. **Hazra, B.**, Wood, D.A., Kumar, S., Saha, S., Dutta, S., Kumari, P., Singh, A.K., 2018. Fractal Disposition and Porosity Characterization of Lower Permian Raniganj Basin Shales, India. *Journal of Natural Gas Science and Engineering*. Volume 59, 2018, Pages 452-465.
48. Varma, A.K., Biswas, S., Patil, D.J., Mani, D., Misra, S., **Hazra, B.**, 2018. Significance of lithotypes for hydrocarbon generation and storage. *Fuel*. Volume 235, Pages 396-405.
49. **Hazra, B.**, Wood, D.A., Vishal, V., Singh, A.K., 2018. Pore-characteristics of distinct thermally mature shales: influence of particle sizes on low pressure CO₂ and N₂ adsorption. *Energy and Fuels*. Volume 32, Pages 8175–8186.
50. **Hazra, B.**, Wood, D.A., Varma, A.K., Sarkar, B.C., Tiwari, B., Singh, A.K. Insights into the effects of matrix retention and inert carbon on the petroleum generation

potential of Indian Gondwana shales. *Marine and Petroleum Geology*. Volume 91, 2018, Pages 125-138.

51. **Hazra, B.**, Wood, D.A., Vishal, V., Varma, A.K., Sakha, D., Singh, A.K. Porosity controls and fractal disposition of organic-rich Permian shales using low-pressure adsorption techniques. *Fuel*. Volume 220, 2018, Pages 837-848.
52. Wood, D.A., **Hazra, B.** Characterization of Organic-rich Shales for Petroleum Exploration & Exploitation: A Review- Part 1: Bulk Properties, Multi-scale Geometry and Gas Adsorption. *Journal of Earth Science*. Volume 28(5), 2017a, Pages 739-757.
53. Wood, D.A., **Hazra, B.** Characterization of Organic-rich Shales for Petroleum Exploration & Exploitation: A Review- Part 2: Geochemistry, Thermal Maturity, Isotopes and Biomarkers. *Journal of Earth Science*. Volume 28(5), 2017b, Pages 758-778.
54. Wood, D.A., **Hazra, B.** Characterization of Organic-rich Shales for Petroleum Exploration & Exploitation: A Review- Part 3: Applied Geomechanics, Petrophysics and Reservoir Modeling. *Journal of Earth Science*. Volume 28(5), 2017c, Pages 779-803.
55. **Hazra, B.**, Dutta, S., Kumar, S. TOC calculation of organic matter rich sediments using Rock-Eval pyrolysis: Critical consideration and insights. *International Journal of Coal Geology*. Volume 169, 2017, Pages 106-115.
56. **Hazra, B.**, Varma, A.K., Bandopadhyay, A.K., Chakravarty, S., Buragohain, J., Samad, S.K., Prasad, A.K. FTIR, XRF, XRD and SEM characteristics of Permian shales, India. *Journal of Natural Gas Science and Engineering*. Volume 32, 2016, Pages 239-255.
57. **Hazra, B.**, Varma, A.K., Bandopadhyay, A.K., Mendhe, V.A., Singh, B.D., Saxena, V.K., Samad, S.K., Mishra, D. Petrographic insights of organic matter conversion of Raniganj basin shales, India. *International Journal of Coal Geology*. Volume 150-151, 2015, Pages 193-209.
58. Varma, A.K., **Hazra, B.**, Chinara, I., Mendhe, V.A., Dayal, A.M. Assessment of organic richness and hydrocarbon generation potential of Raniganj basin shales, West Bengal, India. *Marine and Petroleum Geology*. Volume 59, 2015, Pages 480-490.
59. Varma, A.K., Biswal, S., **Hazra, B.**, Mendhe, V.A., Misra, S., Samad, S.K., Singh, B.D., Dayal, A.M., Mani, D. Petrographic characteristics and methane sorption dynamics of coal and shaly-coal samples from Ib valley basin, Odisha, India. *International Journal of Coal Geology*. Volume 141-142, 2015, Pages 51-62.
60. a) Varma, A.K., **Hazra, B.**, Srivastava, A. Estimation of total organic carbon in shales through color manifestations. *Journal of Natural Gas Science and Engineering*. Volume 18, 2014, Pages 53-57.
b) Atul K. Varma, **Hazra, B.**, Srivastava, A. Corrigendum to ‘Estimation of total organic carbon in shales through color manifestations [J. Natural Gas Sci. Eng. 18 (2014) 53-57]. *Journal of Natural Gas Science and Engineering*. Volume 20, 2014, Page 1.
61. Varma, A.K., **Hazra, B.**, Samad, S.K., Panda, S., Mendhe, V.A. Methane sorption dynamics and hydrocarbon generation of shale samples from West Bokaro and

Raniganj basins, India. *Journal of Natural Gas Science and Engineering*. Volume 21, 2014, Pages 1138-1147.

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Books (Monographs)

1. **Hazra, B.***, Wood, D.A., Mani, D., Singh, P.K. and Singh, A.K., 2019. *Evaluation of shale source rocks and reservoirs* (Vol. 142). Berlin/Heidelberg, Germany: Springer International Publishing.
2. Singh, A.K., Masto, R.E., **Hazra, B.**, Esterle, J. and Singh, P.K., 2020. *Ash from coal and Biomass combustion* (pp. 1-118). Springer International Publishing.
3. **Hazra, B.***, Chandra, D. and Vishal, V., 2024. *Unconventional Hydrocarbon Reservoirs: Coal and Shale*. Springer Nature.

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