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Emerging material from iron ore slime for heavy metal remediation

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In the 21st century, the environmental pollution is gradually increasing due to rapid growth of industry. Consequently, the discharge of toxic heavy metals in terms of effluent from industries are bio-accumulated in living body as well creating water scarcity around the globe. Hence, heavy metals are entering to the food chain. To eliminate the detrimental effects of micro pollutants like lead (Pb(II)) and mercury (Hg(II)), several wastewater treatment methods has been developed by several research groups and industries. However, those methods are either high energy consuming process or high capital investment. Therefore, the present research work aimed to develop a cost-effective process for separation of Pb(II) and Hg(II) using a cost effective new material from industrial by-product. In a integrated steel plant huge amount of iron ore slime is generated which, has no practical use. On characterization of that material, it was found the hydrated iron oxide was present in it as haematite and goethite forms with high surface area. Such kind of iron oxide has very good adsorption properties. The performance for removal of heavy metals of iron ore slime has been examined and it was observed that high concentration of heavy metals can be completely removed from effluent. Such type of adsorber could be utilized in form of adsorption packed column for wastewater treatment and that be applicable within a long range of pH. Such type of material not only help to protect the environment but also ensure low cost and sustainable development of the futuristic wastewater treatment.

Biography

Supriya Sarkar has completed his PhD in 1990 from Visva Bharati University and Postdoctoral studies from Wuhan University. He is the Head of Environment Research Group, R&D Tata Steel Ltd. He has more than 25 years of industrial experience. He has published more than 30 papers in reputed journals and has more than 20 patents.

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