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PRESS RELEASE

IIT (ISM) researchers develop technology for the removal of fine particles and heavy metals from the effluents of coal washeries using Mustard and Moringa seeds as a bio coagulant; use of bio coagulants offer a cost effective, eco-friendly, non-hazardous and biodegradable substitute for chemicals

A group of researchers of Environmental Science and Engineering Department of IIT (ISM) as part of the findings of ongoing research have suggested use of bio coagulants, including Mustard, Moringa Oleifera etc for the removal of high loads of suspended solids like, coal fines, shale, slate, clay minerals and other impurities present in effluents of coal washeries.

The use of Bio Coagulant for removal of unwanted wastes from effluents of coal washeries will also help to avoid the challenges posed due to use of chemicals for waste removal, like post processing of generated sludge, chances on leaching in the surrounding environment.

The findings of research being carried out under the leadership of Sukha Ranjan Samadder, Associate Professor of Environmental Science Engineering Department as per a Coal India Limited funded project worth Rs 54.87 lakh also suggested that the use of Bio Coagulant in place of chemicals offer a cost effective, easily available, ecofriendly, nonhazardous, and biodegradable substitute which produces less volume of sludge.

Prof Samadder, who began the two year research in March, 2022 as Principal Investigator along with two Co Principal Investigators, Kumar Rajeev, Chief Manager (Mining), Head of Environment Department of BCCL; Dr Amartanshu Srivastava, Deputy Manager at Environment Department of BCCL besides Khalid Ansari, Research Associate at his department said, “The coal fines which have a tendency to wash away will be recovered using Bio Coagulant as the Calorific Value of these Coal Fines will be improved as Bio Coagulant itself have some calorific value.

“The use of Bio coagulant also helps to improve the quality of effluent water by removing the coal fines and other contaminants” said Samadder and added that the same water after treatment can be recirculated which can improve washing efficiency as water is cleaner.

Explaining the technicalities, Samadder said, “Fines having a size of less than 0.42 mm are generally responsible for forming slurry, and if this fine is discharged untreated it will lead to deterioration of quality of bother underground water as well as the quality of natural water bodies”

“Heavy metals present in the coal washery effluents are also a cause of concern as they get accumulated in water, soil sediments and living organisms, therefore no effluent is allowed to be discharged outside the washery premises as per present environmental policies” further said Samadder and added the recovery of coal fines from the effluents still pose a lot of challenges.

He further said that the treatment of coal washery effluents in Indian Subcontinent is traditionally carried out with the help of conventional radial thickness which work on the principle of



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sedimentation and added that less effort has been made in field of efficient effluent treatment and trapping of fine particles.

“Generally flocculation technology is applied in most of coal preparation plants to recover fine particles from the tailings of coal washing operations” and added that it is accomplished through the use of inorganic salts, polymeric flocculants or both depending upon physical and chemical characteristics of fine particles present in the suspended and dissolved states

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