National Institute of Technology Rourkela

Progress Seminar

Seminar Title	: Investigation into the Effect of Various Parameters on Oil Agglomeration Process Using Castor and Turpentine Oil
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Supervisor	: Singam Jayanthu
Venue	: Seminar Room, Mining Engineering Department
Date and Time	: 02 Jun 2025 (4.30pm)
Abstract	: Oil agglomeration has gained importance owing to its simplicity and efficiency in beneficiating coal fines. In this study, high ash coal samples taken from six mines in India were put through an oil agglomeration process to investigate the usage of castor oil or blend of castor and turpentine for recovery of coal fines from coal-water slurry. The performance of the process has been evaluated based on ash rejection [AR (%)] and yield (%). Various Statistical analyses were carried out to investigate the role of various process parameters such as pulp density, oil dosage, agitation time, and oil-type on AR (%) and yield (%). Step-wise regression was performed for development of prediction model for AR (%) and yield (%). In case of AR%, the third prediction model (Model-3) among these three developed models was considered as the model with the highest R2 value (0.922) whereas in case of yield (%), among three developed models the third one was considered as the model with the highest R2 value (0.865). Determinant analysis was performed using general linear model (GLM). The findings indicated that pulp density was the strongest determinant for AR (%), followed by oil dosage and agitation time. Similarly, oil dosage was the primary determinant for yield (%), followed by pulp density and agitation time. Sensitivity analysis was also carried out using artificial neural network (ANN) and the results in respect AR (%) revealed that agitation time was the most important predictor followed by pulp density and oil dosage.