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Flocculation and Settling Rate Studies of Clean Coal Fines at Different Flocculants Dosage, pH Values, Bulk Density and Particle Size

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Abstract : The results obtained from settling test of coal fines are used as an important tool to select the dewatering equipment such as thickeners, centrifuges and filters. Coal being hydrophobic in nature does not easily settle when mixed with water. Coal slurry that takes longer time to release water is highly undesirable because it poses additional challenge during sedimentation, centrifuge and filtration. If filter cake has higher than permitted moisture content then it not only creates handling problems but inflated freight costs and reduction in input and productivity for coke oven charges. It is to be noted that coal fines drastically increase moisture percentage in filter cake hence are to be minimized. To increase settling rate of coal fines in slurry chemical substances called flocculants or coagulants are added that cause coal particles to flocculate or coalesce into larger particles. These larger particles settle at faster rate and have higher settling velocity. Other important factors affecting settling rate are flocculent dosage, slurry or pulp density and particle size. Hence in this paper we tried to study the settling characteristic of clean coal fines by varying one of the four factors namely 1. Flocculant Dosage (acryl-amide) 2. pH of the water 3. Bulk density 4. Particle size of clean coal fines in settling experiment and drew important conclusions. Result of this paper will be much useful not only for coal beneficiation plant design but also for cost reduction of coke production facilities.

Keywords : bulk density, coal fines, flocculants, flocculation, settling velocity, pH
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