PROCESSING FLY ASH FOR EFFECTIVE UTILIZATION

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Abstract

The objective of the investigation was to carryout flotation studies on a fly ash sample that analyzed 26.62 % LOI, 19.92% FC, 67.17% ash, 2.17% Moisture and containing mainly silicates and carbonaceous matter with subordinate to minor amounts of iron oxides and bearing alumina minerals, for separating carbon from fly ash, with the non-float fly ash concentrate assaying 5% max. fixed carbon (F.C.) 7% max LOI while focusing on reagent consumption reduction from the present 11kg/t 1:1:1 mix of LDO, Kerosene and MIBC to as a low dosage as possible. Flotation test on – 100 Mesh size fly ash sample [D₅₀, 100 microns] at16% Solids with 3 stages of cleaning by reverse flotation using 1.5 kg/t LDO as the collector and 1.5 kg/t MIBC as the frother, yielded a III cleaner carbon float assaying 34.18% LOI and 53.11 % ash, with 84.9 % LOI recovery at a wt % Yield of 51.3 , while the composite ash concentrate [ Non float] assaying 92.58% ash , 6.43% LOI, and 4.5 %FC with 15.1% LOI recovery at wt % yield of 48.7. Dewatering studies (Cao et. al, 2012) on carbon float have yielded a unit thickener area of 0.16m²/t/day at 0.4 kg/t SUFFLOC–A 1155 (Aruna, et. al, 2011) on non float ash concentrate yielded unit thickener area of 0.26m²/t/day at 1.5 kg/t SUFFLOC – A 1155. The pressure filtration studies at 50% solids on both concentrate and tailings thickened pulp had yielded cakes with 18% moisture at 0.5l/h/m². The work index of the sample was 9 Kwh/short ton. The sample is amenable to processing as the non-float may be used in concrete block pavement industries and the float may be reused after cleaner flotation in columns to reduce ash content. The evolved process mitigates the problem of vexed disposal of fly ash by reprocessing, reusing and recycling besides, reducing reagent consumption during processing.

Keywords: Fly Ash, Processing, Re-Use