

Effect of Magnetic Field Intensity on Iron Ore Separation Efficiency in Slimes

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Abstract

Due to mechanized mining and present system of washing, iron ore industries are facing the problem of huge slime generation. A detailed characterization of the slime generated during processing of ROM, has been studied. This slime is then beneficiated using hydrocyclone followed by wet high intensity magnetic separator to recover the iron valuables. Slime sample generated from ROM through scrubbing and sizing, has been assayed and found to contain 59.25% Fe, 5.14% Al_2O_3 , 4.11% SiO_2 , and 4.83% loss on ignition (LOI). Mineralogy studies through XRD have indicated the presence of hematite and goethite as major iron bearing minerals whereas, gibbsite, kaolinite, quartz as major gangue minerals. The present work involves, separating the gangue mineral from valuable iron bearing minerals viz. hematite etc. as identified during characterization. Multi-stage processing of the slime has been carried out at different magnetic field intensity. Detailed Characterization of the product sample has been carried out to study the effect of field intensity on separation efficiency. Based on these results, a flow sheet has been suggested to improve the yield of the concentrate substantially which is suitable material for the production of iron ore pellet.