Recovery of copper and iron
in the converter slag from a copper smelter

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Abstract: In the light of the close intergrowth and fine uneven dissemination of copper, iron, and silicon minerals in copper converter slag as well as the high hardness and difficult regrinding of the slag, grinding and separating under different grinding fineness are tested. Finally a stage grinding and stage separation flowsheet, which comprises grinding (−0.043 mm up to 79.6%), flotation, magnetic separation, regrinding for flotation middling and magnetic mineral together (−0.040 mm up to 99.32%), re-flotation, and re-magnetic separation, is adopted to treat the slag. Regrinding for magnetic rough concentrate is important for separation of iron and silicon. The feed of the converter slag contains 1.58% Cu, of which copper sulphide, and copper metal amounts to 78.68%, and 53.54% Fe, of which magnetic iron oxide amounts to 28.53%. As a result, the grade of copper concentrate is 19.82% with the recovery of 85.48%. In the meantime, magnetic iron oxide is also recovered. Iron concentrate contains 62.525% Fe and 9.94% SiO_2, with the iron recovery being 35.02%.

Key words: slag; copper; iron; flotation; magnetic separation; regrinding

稀土系列氧化物超细粉末

　　广州有色金属研究院稀土室采用湿法沉淀工艺制备出稀土系列氧化物超细粉末.该粉末纯度 99.00%～99.99%,粒度分布窄,粉末晶形单一,分散性好.

　　稀土氧化物超细粉末与常规粉末相比,在物理、化学性质上具有优异的特性,已被广泛应用于高科技材料之中.例如:在 PLZT,PTC 电阻元件中添加 Y_2O_3,Sm_2O_3,Nd_2O_3 等纳米粉末;CeO_2 纳米抛光粉;催化剂载体;固体燃料电解质;氧传感器;FED,PDP 荧光粉(Y_2O_3:Eu);超导材料;先进结构陶瓷材料等.