

The Removal of Magnetic Substance at Porcelain Insulator Materials by Superconducting High Gradient Magnetic Separator

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It is an important task to construct a recycling society with a low damage on the environment in our century. Magnetic separation is expected to be applied for the industrial waste treatment as an important supporting technology. In the magnetic separation of dry condition, the cohesive force between particles is strong compared with that in the wet condition's magnetic separation. The use of high magnetic field by the superconducting magnet enhances the powder's magnetic substance capture ability of the magnetic separation. Application examined is possible from the industry where superconducting magnetic separation uses the powder.

In this study, the powder for porcelain insulator was used for the superconducting magnetic separation of dry condition. In order to confirm the removal of the magnetic substance, the magnetite and the hematite were mixed. Cryo-cooled NB-Ti superconducting magnet with 100 mm room temperature bore and 600 mm of height was used for magnetic separator. We investigated magnetic properties and particle size distribution of raw materials by VSM and particle analyzer. XRD was used for analysis of content identification of porcelain insulator materials.

The higher applied magnetic field of magnetic separator was shown the higher removal ratio of the powder for porcelain insulator after magnetic separation.

Keywords : HGMS, dry condition, powder, superconducting magnet, porcelain insulator