

Elemental analysis and IR band characteristics of α -Fe₂O₃ and BaFe₁₂O₁₉ steel waste product based

ABSTRACT

This project focused on the elemental analysis and IR band characteristic of α -Fe₂O₃ derived from recycled steel waste product. The steel waste flakes were ball milling for several hours to form a fine powder. The steel waste powder had been purified by using impurity separation technique and magnetic separation technique. The purified steel waste powder then oxidized at 500 oC to form hematite (Fe₂O₃). The hematite were used to synthesize BaFe₁₂O₁₉ by using salt-melt method. The samples were characterized using X-ray Fluorescence (XRF), Fourier Transform Infrared spectroscopy (FTIR), X-ray diffraction (XRD) and energy-dispersive X-ray analysis (EDAX). The XRF and FTIR results show the formation of Fe₂O₃, the IR characteristic bands of Fe₂O₃ and single phase BaFe₁₂O₁₉ is obtained from recycled steel waste product.

Keyword: Mill scales; Hematite (α -Fe₂O₃); Barium ferrites (BaFe₁₂O₁₉); XRF; XRD; FTIR