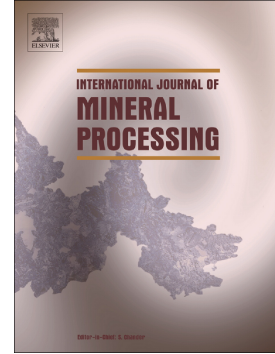


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Discerning mineral association in the near infrared region for ore sortingShekwonyadu Iyakwari^{*,**, a}, Hylke J. Glass^{*}, and Stephen E. Obrike^{**}^{*}Camborne School of Mines, University of Exeter, Penryn Campus, Cornwall TR10 9FE, UK^{**}Department of Geology and Mining, Nasarawa State University, Keffi, P.M.B 1022, Keffi, Nigeria^aCorresponding author: - shekwoi@nsuk.edu.ng (S. Iyakwari)**Abstract**

The preconcentration or early rejection of gangue minerals in mineral processing operations is investigated using sorting, based on interpretation of near infrared sensor data collected from ore particles. The success of sorting depends on the distribution of minerals between particles, the arrangement or association of minerals within particles and the ability of near infrared to distinguish relevant minerals. This paper considers minerals association, using common alteration minerals found in a hydrothermally-formed copper ore, with sensitivity in the near infrared region. The selected NIR-active minerals were arranged along the view of NIR line scanner to stimulate adjacent natural minerals association.

It was found that spectral dominance may depend on minerals near infrared sensitivity and or the position of a mineral along the NIR scanner line of view. Analysis also revealed that only free occurring waste mineral spectra can be targeted for discrimination as tailings. Where spectra appeared mixed, such spectra are best considered products.

Keywords: Near infrared line scanner, preconcentration, copper, gangue, association.

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