

THE DISPERSION-FLOCCULATION BEHAVIOUR OF THE NATURAL RAW CLAY SAMPLES FROM OMARSKA MINE

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In present paper there were studied the dispersion-flocculation behaviour of the primary natural raw clay samples from Omarska mine (Republic of Srpska, Bosnia and Herzegovina). During the processing of iron ore in the Omarska mine, large quantities of fine sized ($<15\mu\text{m}$) waste sludge, with relatively high Fe concentrations, were generated. Our previous results showed that sludge samples are composed of major goethite and quartz, less clay minerals, and minor magnetite and todorokite. Selective flocculation is one of the methods that can be applied for the separation of fine class iron minerals from impurities, and depends on the individual components of the sludge and their behaviour. In order to precisely determine the present mineral phases and their chemical compositions, it was performed XRPD, FTIR and SEM-EDS analysis. The "clay samples" are composed of major quartz and clay minerals which dominate over minor contents of feldspars, amphiboles, goethite and hematite. The clay minerals were identified as mostly illite-sericite which prevails over kaolinite, and with chlorites which appears only sporadically. The dispersion-flocculation behaviour was investigated by settling and flocculation experiments and Zeta potential measurements. A three different dispersants (sodium-hexametaphosphate, sodium-pyrophosphate and sodium-silicate), and anionic and non-ionic polyacrylamide (PAM) flocculants were used. The best results were achieved with sodium-hexametaphosphate (1000g/t) and anionic PAM.

Ključne reči : Omarska mine sludge clays dispersion-flocculation behaviour

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