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High-Temperature X-Ray Powder Diffraction of Secondary Gypsum

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Abstract : This paper involved the performance of a high-temperature X-Ray powder diffraction analysis (XRD) of a sample of chemical gypsum generated in the production of titanium white; this gypsum originates by neutralizing highly acidic water with limestone suspension. Specifically, it was gypsum formed in the first stage of neutralization when the resulting material contains, apart from gypsum, a number of waste products resulting from the decomposition of ilmenite by sulphuric acid. So it can be described as red titanogypsum. By conducting the experiment using XRD apparatus Bruker D8 Advance with a Cu anode (λkα=1.54184 Å) equipped with high-temperature chamber Anton Paar HTK 16, it was possible to identify clearly in the sample each phase transition in the system of $CaSO_4 \bullet xH_2O$.

Keywords : anhydrite, gypsum, bassanite, hematite, XRD, powder, high-temperature
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