Peningkatan kadar logam tanah jarang pada bijih monasit melalui proses mekanokimia dan pemanggangan = Upgrading rare earth elements content from monazite ore with mechanochemical and roasting process

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Abstrak

Unsur Logam Tanah Jarang (LTJ) ditemukan pada bijih monasit yang merupakan produk sampingan dari pengolahan bijih timah di Pulau Bangka, yang kadarnya dapat ditingkatkan melalui proses mekanokimia dan pemanggangan. Proses mekanokimia dilakukan dengan menambahkan NaOH padat dengan variasi penambahan 0%, 33% dan 50% pada umpan bijih monasit. Bijih kemudian dipanggang pada temperatur 400, 500, 600 dan 1000o C. Hasil kemudian dicuci, dikeringkan, lalu diamati morfologi dan nilai grade serta recovery-nya.

Hasil akhir menunjukkan morfologi bijih setelah diberikan perlakuan menjadi lebih halus dalam hal struktur permukaan maupun ukuran butir. Sedangkan nilai recovery paling baik didapatkan pada variasi penambahan NaOH 33% dan temperatur pemanggangan 400o C, yaitu mencapai 91,3%. Proses mekanokimia dan pemanggangan dinilai efektif dalam meningkatkan kadar LTJ pada bijih monasit.

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Rare earth elements (REE) is found in monazite ore that is the by-product from tin ore extraction in Bangka Island, which the grade can be upgraded through mechanochemical and roasting process. Solid NaOH was added to monazite ore in mechanochemical process with addition that variates from 0%, 33% and 50%. The ore was roasted in 400, 500, 600 and 1000o C afterwards, to examine the most optimal temperature for roasting. And the results were washed, dried and then characterized by its morphology, grade and recovery value.

The final results showed that the ore morphology became finer by its surface structure as well as the grain size that reduced. The best recovery value is obtained by the sample with 33% NaOH addition and 400o C roasting temperature which was 91,3%. Mechanocehemical dan roasting process was successfully upgrading REE content in monazite ore.