Studi pengaruh variasi konsentrasi larutan naoh pada proses pelindian naoh yang diikuti pelindian hclo4 terhadap peningkatan kadar niobium, tantalum, dan logam tanah jarang dalam terak timah = The Study of effect concentration variable of naoh solution in naoh leaching followed by hclo4 leaching process to enhance grades of niobium tantalum and rare earth element in tin slag

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Abstrak

Terak timah merupakan residu peleburan timah yang memiliki potensi sebagai sumber sekunder untuk mendapatkan critical metals, seperti niobium, tantalum dan logam tanah jarang LTJ. Penelitian ini bertujuan untuk mengetahui pengaruh konsentrasi larutan NaOH, yaitu 6 M dan 8 M, pada proses pelindian NaOH selama 1 jam diikuti pelindian HClO4 dengan konsentrasi 0.8 M selama 2 jam, terhadap peningkatan kadar niobium, tantalum dan LTJ dalam terak timah. Pada penelitian ini digunakan terak timah yang melalui pemanggangan pada temperatur 900? diikuti pendinginan cepat. Hasil pemanggangan dikarakterisasi dengan menggunakan SEM Scanning Electron Microscope dan sebagian lainnya dilakukan proses pelindian. Residu setiap pelindian dikarakterisasi menggunakan XRF X-Ray Fluorescence , sedangkan filtrat setiap pelindian dikarakterisasi dengan menggunakan ICP-OES Inductively Coupled Plasma-Optical Emission Spectrometry dan AAS Atomic Absorption Spectroscopy . Dari hasil pelindian NaOH, pada konsentrasi 8 M NaOH terjadi penurunan kadar niobium di dalam terak timah sebesar 6.25 . Namun, perolehan kadar tantalum dan cerium tertinggi terdapat pada konsentrasi 8 M yaitu sebesar 0.21 dan 4.01 , secara berurutan. Dari hasil pelindian HClO4, larutan HClO4 diketahui dapat meningkatkan kadar niobium dan tantalum. Sedangkan LTJ mengalami penurunan kadar di dalam residu setelah pelindian HClO4. Pelindian HClO4 mampu menurunkan kadar unsur ikutan seperti aluminium dan kalsium.
<hr>Tin slag, the residue from tin smelting process, has big potential as alternative sources to obtain critical metals, such as niobium, tantalum and rare earth elements REEs . The aims of this study is to discover the effect of NaOH leaching, in various leaching concentations of 6 M and 8 M for 1 hour, followed by HClO4 0.8 M leaching for 2 hours on the enhancement grades of niobium, tantalum and REEs. In this process, tin slag was roasted at 900 in 2 hours, followed by water quenching, then sieved. One part of roasted tin slag was characterized by SEM Scanning Electron Microscope , and the other part was used for leaching process. Each residues characterized with XRF X Ray Fluorescence , while each filtrates characterized with ICP OES Inductively Coupled Plasma Optical Emission Spectrometry and AAS Atomic Absorption Spectroscopy . From NaOH leaching process, at concentration of 8 M NaOH there was a decrease of niobium grades in tin slag residue of 6.25 . However, the highest tantalum and cerium grades was found at 8 M concentrations of 0.21 and 4.01 , respectively. From HClO4 leaching process, it is known that HClO4 can increase niobium and tantalum grades in leaching residue. While REEs tend to decrease in leaching residue and it is known to decrease the grades of aluminium and calcium in leaching residue.