Studi Literatur Efek Mekano-Kimia Akibat Pra-Perlakuan Penggilingan terhadap Proses Reduksi Karbotermik Imenit = Literature Study of Mechanochemistry Effect due to Milling Pre-Treatment towards Ilmenite Carbothermic Reduction Process

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Abstrak

Ilmenit merupakan salah satu sumber utama dari titanium dan pigmen TiO2. Salah satu teknik pengolahan ilmenit adalah dengan proses reduksi dan kemudian dilakukan proses pemisahan seperti pelindian. Sudah banyak usaha yang dilakukan dalam meningkakan efisiensi dan efektivitas proses pengolahan ilmenit, salah satunya secara mekano-kimia. Pra-perlakuan penggilingan dapat memberikan aktivasi mekanik terhadap ilmenit. Aktivasi mekanik dapat meningkatkan specific surface area, merubah struktur kristalin mineral menjadi lebih halus, serta mempercepat laju reaksi dan transformasi fasa. Aplikasi proses penggilingan juga dapat mempengaruhi kinetika reduksi karbotermik ilmenit, menurunkan suhu onset reaksi karbotermik, menurunkan dan memisahkan puncak endotermik reaksi karbotermik sehingga reaksi deoksidasi terjadi lebih selektif dan cepat, serta meningkatkan tingkat disolubilitas Fe dari ilmenit. Tingkat aktivasi mekanik penggilingan dipengaruhi oleh proses penggilingan sendiri, durasi penggilingan, intensitas penggilingan, kondisi penggilingan, serta jenis penggilingan.

.....Ilmenite is one of the main sources of titanium and TiO2 pigment. One way to process ilmenite is by conventional reduction process then followed by separation step such as leaching. There has been many effort done to increase efficiency and effectivity of ilmenite processing, one of it is via mechanochemical way. Milling pre-treatment can result in mechanical activation of ilmenite whereas this mechanical activation will lead to increasing of specific surface area, refinery of crystallin structure, and hasten reaction rate and phase transformation. Application of milling pre-treatment also can affect carbothermic reduction kinetic, lower onset temperature for carbothermic reaction, lower and divide endothermic peak so that deoxidation reaction may occur faster and more selective, and increasing Fe dissolubility rate from ilmenite. Level of mechanical activation due to milling is determined by many factors such mechanical activation process, milling duration, pressure/weight intensity of milling, environment condition during milling pre-treatment, lastly type of milling processes. All this factor will be the focus of the study.