

Analisis pengaruh konsentrasi fluks terhadap proses ekstraksi titanium dioksida dari pasir besi Tasikmalaya dengan menggunakan metode pyro hydrometallurgy = Analysis of the effect of concentration flux of extraction process of titanium dioxide from Tasikmalaya s iron sand by using pyro hydrometallurgical method

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Abstrak

Banyaknya ilmenit di Indonesia sebagai bahan baku besi-baja sudah sering terdengar. Titanium sebagai logam serba guna yang juga terkandung di dalam ilmenit bisa menjadi industri baru di Indonesia. Tidak berkembangnya industri titanium di Indonesia karena harganya yang mahal dan pengolahannya yang sulit. Dalam penelitian ini dilakukan pengolahan titanium yang sederhana dan dengan bahan baku yang cukup minim namun menghasilkan recovery yang cukup.

Pada penelitian ini diuji efek dari konsentrasi fluks pada hasil recovery titanium dengan bukti pengendapan pada proses leaching. Fluks yang digunakan adalah natrium hidroksida digunakan untuk mereduksi titanium dari ilmenite. Konsentrasi fluks memiliki tiga variabel yaitu 1:1 (Ilmenite:NaOH), 1:1.5, dan 1:0.5. Sampel dipreparasi dengan magnetic separator dan juga pengayakan untuk mendapatkan FeTiO₃ dan ukuran partikel #120, dan dikarakterisasi terlebih dahulu dengan hasil Ti sebesar 3.21%, kemudian di lebur bersama dengan fluks dan aditif. Setelah dilebur dan dicuci dengan aquades kemudian disaring. Filtrat yang berada di kertas saring dianggap sebagai tailing dan diuji menggunakan spectrometer UV Vis dengan hasil konsentrasi Ti 1:0.5, 1:1, 1:1.5 yaitu 12.2 mg/L, 11.8 mg/L dan 11.26 mg/L. Kemudian konsentrat yang berhasil lolos dari kertas saring dilindih dengan pH 7. Endapan yang terjadi di saring dan hasil saringan diuji Spektrometer UV Vis dengan hasil konsentrasi Ti terhadap variabel fluks 1:0.5, 1:1, 1:1.5 yaitu 24.8 mg/L, 13.07 mg/L, 12.1 mg/L. %recovery titanium Setelah proses pirometalurgi berdasarkan konsentrasi fluks 1:0.5, 1:1, 1:1,5 adalah 92,83%, 82,55%, dan 75,389% dan %recovery titanium setelah proses pelindihan sesuai dengan konsentrasi fluks adalah 18,9%, 8,723% dan 8.52%. Penggunaan natrium hidroksida membantu titanium pelepasan ikatan dari ilmenite, tetapi memiliki batas optimal, dalam hal ini konsentrasi optimumnya adalah 1:0.5 (ilmenit: NaOH).

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Most ilmenite in Indonesia becomes iron-steel making's feed is commonly heard. Titanium as a multifunctional metals which also contained in ilmenite, can be a breakthrough in Indonesia. The undeveloped titanium industry in Indonesia is because of the difficulties of processing which also expensive. In this research, titanium processing with a simple practice is applied and also with minimum resources but resulting great titanium recovery.

In this research, the concentration of flux is tested for seeing the result of titanium recovery with a proof of suspension on leaching process. The flux that is being used is sodium hydroxide which is reducing titanium from ilmenite. The flux concentration is split into 3 variables which are 1:1 (Ilmenite:NaOH), 1:1.5, and 1:0.5. The sample preparation starts with applying iron sand on magnetic separator to separate the ilmenite,

silicate, and also magnetite. After that the ilmenites are sieved with a #120 sieve as a result its mass is 150 grand then the ilmenite is characterized with EDX and resulting a 3.21% titanium. The ilmenites are mixed with flux and additive on fusion process at 900oC. The molten ilmenites are poured into a mold and crushed into a pieces, after that the crushed ilmenites are rinsed with aquades due to separate the titanium dioxide with filter. The amount of ilmenite that stays on the filter is assumed as a tailing and characterized by AAS (Atomic Absorption Spectroscopy) and the result of % Ti according to the concentration of flux 1:0.5, 1:1, 1:1.5 are 12.2 %, 11.8% and 11.26 %. Filtrate that passed the filter is leached with pH 7. The suspension that happened on leaching process is also filtered and the filtrate is characterized with AAS, and the result of Ti concentration according to the concentration of flux 1:0.5, 1:1, 1:1.5 are 24.8 mg/L 13.07 mg/L, 12.1 mg/L. Titanium recovery after pyrometallurgy process according to the concentration of flux 1:0.5, 1:1, 1:1.5 are 92.83 %, 82.55 %, and 75.389 % and titanium recovery after leaching process according ti the concentration of flux are 18.9 %, 8.723 % and 8.52 %. The usage of sodium hydroxide helps titanium breaks its bond from ilmenite, but it has its optimum limit, in this case its optimum concentration is 1:0.5 (ilmenite:NaOH).