Imobilisasi limbah uranium dari dekomisioning pemurnian asam fosfat PT. Petrokimia Gresik dengan bahan matriks synroc siliko-fosfat = Immobilization of uranium waste from decommissioning phosphoric acid purification facility of PT. Petrokimia Gresik using matrix material of siliko-phosphate synroc

Sarah Sholihatul Amalia, author

Abstrak

ABSTRAK
Penelitian imobilisasi limbah uranium telah dilakukan menggunakan bahan matriks synroc siliko-fosfat dengan proses sintering pada suhu tinggi. Proses imobilisasi dilakukan dengan cara mencampurkan limbah radioaktif uranium dengan matriks bahan prekursor oksida (matriks synroc), kemudian campuran tersebut dikeringkan, dan dikalsinasi pada suhu 750 oC. Serbuk hasil kalsinasi dipres dingin dalam cetakan, blok limbah hasil pencetakan kemudian dilakukan proses sintering pada variasi suhu 900 - 1300 oC selama 1 - 4 jam untuk membentuk suatu keramik multi-fase monolit yang kompak padat. Tingkat muat limbah dalam blok synroc limbah divariasi antara 10 sampai 50 % berat. Penelitian ini bertujuan untuk mendapatkan teknologi proses imobilisasi limbah uranium menggunakan matriks synroc supercalcine siliko-fosfat. Kualitas blok synroc limbah hasil imobilisasi ditentukan dengan pengujian densitas, kuat tekan, dan laju pelindihan uranium dan diuji kandungannya menggunakan XRF. Hasil menunjukkan bahwa blok synroc limbah optimum pada suhu sintering 1200 oC selama 3,5 jam dengan tingkat muat limbah sebesar 30 %.
<hr>
ABSTRACT
The research of uranium waste immobilization using matrix material of silico-phosphat synroc had been carried out by sintering process at high temperature. Immobilization process was carried out by mixing the uranium radioactive waste with oxide precursor matrix material (synroc matrix), then the mixture was dried and calcined at temperature of 750 oC. Then, the powder of calcination result was pressed in the moulder, further the sintering process was carried out at a temperature of 900 - 1300 ° C for 1 to 4 hours to form the synroc of multi-phase ceramic of monolith compact solid. Waste loading in the waste synroc block was varied between 10 to 50% weight. This research aimed to obtain the process technology of uranium waste immobilization using a matrix material of supercalcine silico-phosphate synroc. The quality of waste synroc blocks producted from the immobilization process was determined by testing of the density, compressive strength, and the leaching-rate of uranium, and the composition of synroc obtained by using XRF.