



Laser Fluorimetric Determination of the Extracted Uranium from Industrial Grade Phosphoric Acid and Phosphate Rocks using Natural Adsorbent, EWS

A. A. Abdou

Nuclear Materials Authority (NMA), P.O box 530 El Maadi, Cairo, **EGYPT**

Email: abdouchem76@gmail.com

Accepted on 16th October 2017, Published on 27th November 2017

ABSTRACT

Laser fluorimetric determination of the complete reduced U(IV) using Zn metal was applied on industrial grade phosphoric acid and phosphate rocks after separation using a low cost natural cationic adsorbent of Egyptian white silica sand (EWS). The determination process was performed after prior separation of cationic uranyl complex. This method was applied to overcome the interfering problems of P(V), Fe(III) and Ca(II). For maximum loading efficiency, the adsorption parameters such as pH, amount of adsorbent, contact time, temperature and initial U(IV) concentrations were investigated via batch process. On the other hand the effective elution factors such as eluting agents, ratio of Na₂CO₃ with NaHCO₃, volume of 30% H₂O₂, contact time and temperature were also investigated. A selective elution of oxidized U(VI) was carried out by using 1mol L⁻¹ mixture of Na₂CO₃ and NaHCO₃ solution in the presence of (0.8 mL 10 mL⁻¹) of 30% H₂O₂ as an oxidizing agent. The maximum U loading capacity (75 mg g⁻¹) was attained at the resulted optimum loading and elution conditions.

Keywords: U(IV), U(VI), Egyptian white silica sand (EWS), Industrial grade phosphoric acid, Phosphate rocks, Loading Elution.
