شبكة المعلومات الجامعية

بسم اللّه الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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شبكة المعلومات الجامعية

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بالرسالة صفحات
لم ترد بالأصل

URANIUM SORPTION ONTO SOME SEDIMENTS AND ITS REMEDIATION

By

HODA ABD ELNABI REFAEI ALI AHMED
B.Sc. Agric. Sc. (Soil Science), Fac. of Agric., Cairo Univ., 2004
M.Sc. Agric. Sc. (Soil Science), Fac. of Agric., Cairo Univ., 2012

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ABSTRACT

Hoda Abd El-Nabi Refaei: Uranium Sorption onto Some Sediments and Its Remediation. Unpublished Ph.D. Thesis, Department of Soil Science, Faculty of Agriculture, Ain Shams University, 2020.

The purpose of this investigation is to study how to remove and/ or reduce uranium pollution in certain area in Sinai (Wadi Um Hamad, southwest Sinai, Egypt). Two methods were tried:

1- Chemical method in which natural clay deposits were used before and after their modification.

2- Phytoremediation using sunflower plant.

In the first method, two different kinds of deposits, kaolinitic dominant sediment while other is smectite dominant one. In this experiment both deposits were used before and after their modification. Modification involved acid activation and calcination. The second remediation method is the phytoremediation in which sunflower plant was used in pots experiment.

This investigation involved also, studying factors affected adsorption and desorption of uranium by the modified and non-modified sediments such as: concentrations of adsorbate, temperature, pH, contact time and quantities of adsorbents. Also, sequential extraction of uranium adsorbed by different constituents of the sediments, i.e., organic, carbonate, exchangeable, oxides and residue, were estimated.

In the following are some of the obtained results:

- Um Hamad sediments have sandy loam texture, non-saline, but alkaline (pH= 8). Total and available uranium are 260 ppm and 28 mg/l, respectively.
- Adsorption of uranium was highest at pH 5 and 6 by kaolinitic and smectitic sediments, respectively. U adsorbed by smectitic sediments is higher than that adsorbed by kaolinitic one. especi

- Modification of clay deposits by calcination improved their adsorption capacity than acid activation treatment.
- The kinetics studies showed adsorption expressed well by pseudo second-order model. Sodium acetate solution is the best eluent for uranium desorption from loaded adsorbent.
- Results of phytoremediation by sunflower reveal that uranium accumulated in roots than shoots, and generally increased by increasing U. Furthermore dry weight of sunflower increased by increasing plant age. It is worth to mention that the increase of dry weight of sunflower plant by increasing U concentration is not related to any positive effect for U on plant. It is well known fact that U is not an essential element. This increase in plant dry weight is related mainly to soil type as explained in the text.

Key words: Uranium, Um Hamad, Adsorption, Desorption, Smectite, Kaolinite, Remediation, Phyto-extraction, Sunflower.

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