قال تعالى:

"اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ{1} خَلَقَ الْإِنسَانَ مِنْ عَلَقٍ{2} اقْرَأْ وَرَبُّكَ الْأَكْرَمُ{3} الَّذِي عَلَّمَ بِالْقَلَمِ{4} عَلَّمَ الْإِنسَانَ مَا لَمْ يَعْلَمْ{5}"

صدق الله العظيم

سورة العلق الآيات من (1-5)

Dedication

To the ones whom I care much for

To my parents

To the one who gave me faith,

strength, pleasure

Love just by being there

To you

To the ones who contributed to my

well being

To my colleagues

With love.

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Laboratories (C.P.L). Thanks are extended to whomever in wherever hereby contributed in the bringing up and in the completion of this research.

Thanks everybody.

Abstract

(English)

Zeolite samples were collected from Wadkawly in Gadarif region. These samples were characterized with respect to both physical and chemical properties. X-ray Diffraction Analysis (XRD) showed these samples to be composed of Thomsonite zeolite, exclusively. The samples were treated with strong brine solution to ensure that Na-zeolite is generated and used as the stationary ion exchange phase. Solutions containing 100ppm of the ions (Pb^{2+} or Fe^{3+} or Ni^{2+}) were artificially prepared, then processed with the zeolite. Excellent extraction was achieved, with final residual concentration of 0.02 ppb, 3.0 ppb and 1.38 ppm for (Pb^{2+}, Fe^{3+} and Ni^{2+}) respectively. This gives extraction efficiency of ~ 100 %, 99.9 %, and 98.6 %, for Pb^{2+} , Fe^{3+} and Ni^{2+}, respectively. The relative efficiency is, therefore :

$Pb^{2+} > Fe^{3+} > Ni^{2+}$.

الخـلاصــة

جمعـت عينـات مـن الزيـوليت مـن ود كـولي فـي منطقـة القضارف. أجريت دراسة للخصائص الفيزيائيـة والكيميائيـة لهـذه العينات. وقد بين التحليل بحيود الأشعة السينية أن هـذه العينـات تنتمـي حصـراً إلـى فصـيلة الزيـوليت المعروفـة "بالتمسـونيت". وجرت معالجـة العينـات بحلـول الملـح المركـز للتأكـد مـن أنتـاج زيوليت الصوديوم (Na-Zeolite) الـذي وظـف كـالطور الثـابت فـي عملية التبادل الأيوني. وتم تحضير محاليل من الأيو نات (Pb^{2+} و Fe^{3+} و Ni^{2+}) تحوي (100 ppm) ثم عولجت بالزيوليت. و جد أن ا ستخلاص هذه الأيونات تحـ قق بدرجة ممتازة، معطياً تراكيز نهائية هي 0.02 جزء من بليون و 3.0 جزء من بليون و 1.38 جزء من مليون للأيونات (Pb^{2+} و Fe^{3+} و Ni $^{+2}$) على التوالي. ويعطي هذا فعالية ا ستخلاص ~ 100%، و 99.9% و 98.6% للأيونات (Pb^{2+} و Fe^{3+} و Ni^{2+}) ، على التوالي. ومن ثم فإن الفعالية النسبية للاستخلاص هي:

$$Pb^{2+} > Fe^{3+} > Ni^{2+}.$$

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