Removal of Nickel Ions from Electroplating Wastewater Using Nano-Kaolinite Extracted from Sweileh Sand Deposits

A. Natour, Tala (School: Jubilee School)
Alqudah, Rand (School: Jubilee School)

This study aimed to examine the efficiency of using Nano-Kaolinite (Al2Si2O5 (OH)4) to purify electroplating wastewater from Nickel, and to examine wither or not it offered functional and affordable solution using Nano-Kaolinite extracted from Sweileh Sand Deposits. The methodology consisted off our mainsteps: extracting Nano-Kaolinite from Sweileh Sand using Hydrochloric acid, preparing the column method with certain amount of Nano Kaolinite for applying the main experiment, preparing Nickel Chloride Solution then pouring it through the Nano-Kaolinite column to test the efficiency of Nano-Kaolinitein Nickel purification, and, finally, applying the same method on a sample of electroplating factory waste water. After the Nickel concentration was measured, then measuring its concentration in produced water, the results showed the high efficiency of Nano-Kaolinite in Nickel adsorption, therefore the resulted water were highly purified with an average of 98.88% purification. The Nano Kaolinite adsorption capacity is 115-120mg/g. The purified resulting water can be used for agricultural purposes, so it is going to solve a big part of water shortage problem in Jordan and in the world, considering that 3.6 billion people worldwide (nearly half the global population) are already living in potential water-scarce areas for at least one month a year and the number could increase to 4.8–5.7 billion by the year 2050. In addition, the process could save the humans, animals, plant, soil and underground water from Nickel toxic effects. The Nano-Kaolinite adsorption capacity is 115-120mg/g, and decreases as it is used for purification, but that can be solved by adding NaOHorHCl to the Nano-Kaolinite purification filter tore move the Nickel. The removed Nickel can be reused in electroplating, so Nano Kaolinite can be reused again.

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