# LANGMUIR ISOTHERM STUDY OF Ni (II) ION REMOVAL FROM AQUEOUS SOLUTIONS BY NOVEL MODIFIED SYNTHETIC COPOLYMER

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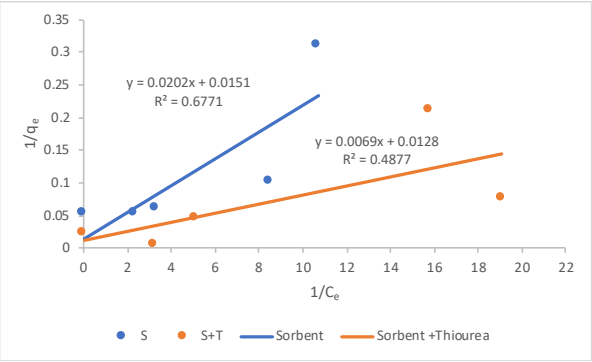
It is well recognized that water is an extremely precious natural resource for people and other living things, water pollution is today seen as a severe issue that affects the entire world. Inorganic pollutants, particularly heavy metals, are distinct from other types of pollutants. The main features of this group of elements are that they are extremely toxic even at the ppm level [1].

The adsorption method of removing nickel ions from water has made tremendous strides in the last few years. Still, there is a need to research their qualities and create new, more efficient sorbents that can be produced quickly and with a large proportion of low or high concentration [2].

The goal of the work that is being offered is to analyze the sorption of Ni(II) ions from its aqueous solutions utilizing a polymer chelating sorbent that is based on a copolymer of maleic anhydride and 2-(4-aminobenzenesulfamido)-thiazole with styrene. In order to boost the sorption capacity of this sorbent, it was modified by a novel thiourea derivative - N, N'-diisopropyl thiourea. The Langmuir adsorption isotherm [3] has been studied for predicting sorption behavior of new sorbent and after modification.

The primary copolymer and modified sorbent exhibit highest sorption capacity at pH=3. The sorption capacity is 18.5 mg/g for the initial copolymer and 23.24 mg/g for the modified sorbent. The study examined how time affects the sorption process and found that after 60 minutes, it steadied and achieved equilibrium.The Langmuir adsorption isotherm calculation show that the $R_L$ is between 0 and 1 and equal to 0.99 when only sorbent is used and after modification , which indicates that the adsorption is favorable under the experimental conditions determined by the Langmuir model. Also, the value of the regression coefficient is $R^2$=0.4877 and 0.6771, respectively, indicating that this isotherm model is in good agreement with the experimental adsorption data.




**References**

1. Xu, X., Yang, H., and Li, C.. Theoretical Model and Actual Characteristics of Air Pollution Affecting Health Cost: A Review. Int. J. Environ. Res. Public Health. 2022, 19, 6, 3532.
2. E.Noman, A.Al-Gheethi, R.Maya Saphira, R.Mohamed et.al., Sustainable approaches for nickel removal from wastewater using bacterial biomass and nanocomposite adsorbents: A review. Chemosphere. 2022, 291, 291, Part 1, 132862
3. L Anah, N Astrini.Isotherm adsorption studies of Ni(II) ion removal from aqueous solutions by modified carboxymethyl cellulose hydrogel.IOP Conf. Series: Earth and Environmental Science, 2018, 160, 012017

## ФОТОМЕТРИЧЕСКОЕ ПРИМЕНЕНИЕ КОМПЛЕКСА Sm (III) С ПИРОГАЛЛОЛОМ

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Редкоземельные элементы и их соединения имеют широкий спектр применения. Их соединения используются при производстве лаков и красок в химической промышленности, в качестве катализаторов в нефтяной промышленности. Эти элементы добавляют в сталь, чугун и сплавы, повышая их устойчивость к коррозии. Поэтому определение микроколичеств этих элементов в указанных материалах и природных объектах является одной из актуальных проблем.

В представленной работе с использованием азосоединений, синтезированных на основе пирогаллола, фотометрическим методом изучены бинарные и многолигандные комплексы самария [1,2]. Азосоединение синтезировано по известной в литературе методике. Структура реагента изучена методами ЯМР и ИК-спектроскопии.