

## PYRIDAZINE CHROMIUM COMPLEXES IN NaY ZEOLITE

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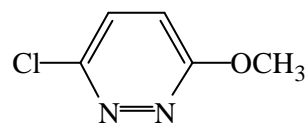
### Abstract

The immobilization of transition metal complexes with redox catalytic activity in solid supports has attracted much interest due to their potential use as heterogeneous catalysts in mild conditions.

One of the most common strategies for the preparation of zeolites with metal transition complexes is the flexible ligand method. The incorporation of the cation requires the exchange with the charge-balancing cation from zeolite framework [1]. Two different procedures for ion exchange are: the traditional ion exchange from aqueous solutions containing the metal and metal biosorption by microorganisms supported on the zeolite [2]. In previous work, we reported the development of a biosorption system for Cr(IV) removal from industrial wastewater, by using bacterial biofilm supported on zeolites. The system has shown ability to remove chromium from aqueous solutions with concentrations ranging 10 – 250 mg/L. The biological activity of the employed bacteria, *Arthrobacter viscosus*, induces reduction of the Cr (VI) to Cr (III) species [3].

The aim of this work is to evaluate the traditional ion exchange and the biosorption paths for the immobilization of chromium complexes in NaY zeolite. The bio-monomer under investigation, the 3-methoxy-6-chloropyridazine, is a bi-dentate ligand and can offer only nitrogen atoms as donors (Scheme 1). Complexes of chromium with pyridazine have the potential to act as catalysts for oxidation of phenols in mild conditions.

The pyridazine derivative ligand and the new materials were characterized by chemical analysis, spectroscopic methods (NMR, FTIR and UV/Vis), XRD and thermal analysis (TGA). The data obtained from various techniques of characterization are compatible with the fact that the chromium complexes were effectively immobilized in NaY zeolite by two different procedures. The data indicate that all complexes achieved by both procedures are Cr(III) pyridazine derivative complexes inside the NaY structure.



Scheme 1 - 3-methoxy-6-chloropyridazine ligand

### References.

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