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Removal of heavy metal ions with the use of chelating polymers obtained by grafting pyridine-pyrazole ligands onto polymethylhydrosiloxane

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7 **grafting pyridine-pyrazole ligands onto polymethylhydrosiloxane**
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24 **Abstract**
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28 New chelating polymers soluble in organic non-polar solvents were synthesized by
29 hydrosilylation reaction of polymethylhydrosiloxane with pyridine-pyrazole ligands. Two
30 types of linkers were used to graft pyridine-pyrazole ligands onto polymethylhydrosiloxane.
31
32 The composition and properties of the polymers obtained were studied by NMR spectroscopy,
33 Fourier transform infrared spectroscopy, elemental analysis, thermogravimetric analysis and
34 derivative scanning calorimetry. The effects of various parameters such as initial metal ion
35 concentration, contact time, temperature and pH were examined in the processes of extraction
36 of Cu²⁺, Cd²⁺, Cr³⁺, Ni²⁺ and Co²⁺. The equilibrium data were best represented by Langmuir
37 isotherm and the uptake capacities of polymers obtained varied between 0.24 mmol (for Co²⁺)
38 and 1.48 mmol (for Cu²⁺) per 1 g of polymer. The adsorption kinetics was found to follow the
39 pseudo-second-order kinetic model. The polymers adsorption capacity was more than 90%
40 level after five cycles of adsorption-desorption. Treatment of real wastewater samples showed
41 good ability of the polymers to absorb metal ions.
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