

UNIwersytet Ekonomiczny we Wrocławiu
Wydział Inżynieryjno-Ekonomiczny
Katedra Technologii Chemicznej

PRACA DOKTORSKA

**Badania nad usuwaniem siarczków z roztworów wodnych
z wykorzystaniem polimerów hybrydowych zawierających tlenki metali
otrzymywanych na bazie wymienniczy jonowych**

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PROMOTOR:

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Załącznik 2. Streszczenie pracy w języku angielskim (max 200 słów)

Hybrid ion exchangers (HIX) containing iron(III), copper(II) or manganese(IV) oxides based on macroporous and gel-type ion exchangers (anion and cation exchangers) as supporting materials were obtained. Obtained products were characterized using scanning microscope equipped with an EDS analyzer (SEM/EDS), Fourier-transform infrared spectroscopy (FTIR), and X-ray powder diffraction (XRD). Their porous characteristics were determined from the adsorption isotherms for liquid nitrogen at 77 K, and mercury porosimetry. Afterwards HIX were tested for removal of sulfides ($\text{H}_2\text{S}_{(\text{aq})}$, HS^- , S^{2-}) from aqueous solutions. Adsorption experiments were carried out in the batch regime, in nitrogen atmosphere, by mixing 0,3 g of hybrid polymers with $100 \text{ cm}^3 \text{ Na}_2\text{S}\cdot 9\text{H}_2\text{O}$ in deoxygenated distilled water with $50\text{-}500 \text{ mg S}^{2-}/\text{dm}^3$ concentration. Total sulfur content adsorbed on the HIX surface was determined by Eschka method. Concentrations of sulfide oxidation products present in the solution were measured by high performance liquid chromatography (HPLC) method with conductometric detection. After identification and quantification of the products mechanisms of sulfides removal by different metal oxides present in different supporting materials were proposed. Regeneration experiments for HIX containing iron(III) oxides were carried out. The best hybrid polymers for sulfides removal from water were chosen for further studies.

