

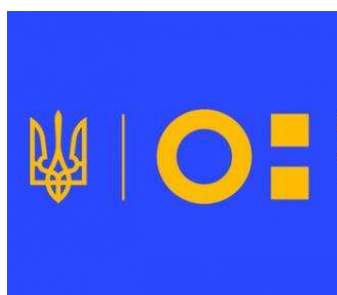
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PROCEEDINGS



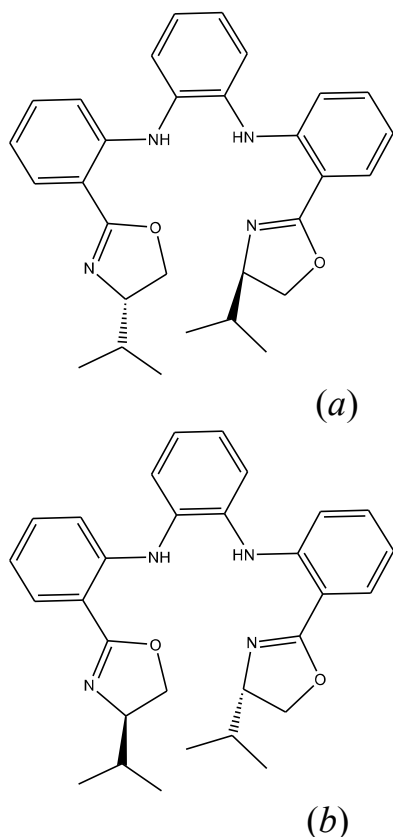


Fig. 1. Structural formulas of ligands L1 (a) L2 (b)

By oxidizing aromatic sulfides with hydrogen peroxide in the presence of $\text{Mn}^{\text{II}}(\text{L2})$, chiral sulfides with enantiomeric excess up to 98% were obtained on a scale of up to 1.2 g. A functionalized sulfoxide with an amino group, *tert*-butyl (2-((4-bromophenyl)sulfinyl)ethyl)-carbamate, was synthesized with a product enantiomeric excess of 93%. Using the example of 3-(methylthio)thiophene, it was demonstrated that using $\text{Mn}^{\text{II}}(\text{L1})$ and $\text{Mn}^{\text{II}}(\text{L2})$ isomers leads to the formation of S- and R-isomers of sulfoxide with high optical purity.

The developed method holds promise for the application in asymmetric selective transformation of organic sulfides into sulfoxides.

- [1] W. Dai, J. Li, B. Chen, et al. Asymmetric Oxidation Catalysis by a Porphyrin-Inspired Manganese Complex: Highly Enantioselective Sulfoxidation with a Wide Substrate Scope // *Org. Lett.* – 2013. – 15 (22). – P. 5658–5661.

POLY(SODIUM ACRYLATE)/POLYSILOXANE HYDROGELS FOR THE ADSORPTION OF CATIONIC DYES

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Ukraine is included in the list of countries in which the lack of water reserves is recorded. Pollution of water resources, especially by organic dyes and pigments, poses a great threat to the environment and human health. The difficulty of cleaning water from cationic dyes is due to their ability to form stable complexes with negatively charged substances in wastewater.

Therefore, the purpose of this work was to develop a sorbent based on poly(sodium acrylate) (PAANa,) and poly-N-(2-aminoethyl)-3-aminopropyltrimethoxysilane (PAPTMS) for the cationic dyes sorption.

PAANa/PAPTMS hydrogels were prepared by one-pot simultaneous cross-linking processing, which includes a combination of free radical polymerization of

Table 1. Parameters of Azur-1 sorption by PAANa/PAPTMS hydrogels

Sample	1 hour 30min			24 hours		
	γ , mmol/g	ϕ , wt. %	w, g/g	γ , mmol/g	ϕ , wt. %	w, g/g
PAANa	0.0233	8	1.59	0.0071	72	28.13
PAANa/PAPTMS; 90/10	0.0612	32	2.57	0.0126	86	36.09
PAANa/PAPTMS; 80/20	0.0159	48	2.22	0.0059	81	19.65
PAANa/PAPTMS; 70/30	0.0171	36	2.12	0.0064	76	9.99

AAANa (neutralisation degree was 25 wt.%) in a presence of N,N'-methylene-bis-(acrylamide) cross-linker and catalytically-induced condensation of APTMS. The cross-linking of PAANa was verified by the absence of C=C double bonds by FTIR. The sorption kinetics was studied using a solution of trimethylthionine chloride (Azur-1) as water-soluble cationic dye. The concentration of Azur-1 was determined by UV spectrophotometer ULAB 102 at wavelengths of 615 nm. Parameters of sorption such as swelling degree (w, g/g), the dye fraction removed from the solution (ϕ , %) and the specific sorption capacity of the sorbent (γ , mmol/g) are presented in the Table 1.

The swelling capacity of the hydrogel was evaluated in distilled water, it was found that the incorporation of 10 wt.% PAPTMS enhanced the water absorbency by 316% (from 16.81 to 70.22 g/g). The obtained results indicate that the hydrogels with PAANa content 90 and 80 wt.% are the most effective sorbent for removing the cationic dye Azur-1 from the solution.

PURCELL FACTOR OF A DIPOLE IN THE VICINITY OF A SPHERICAL METAL NANOPARTICLE

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It is known that when the size of a nanoparticle is lower or comparable to the wavelength, the rate of radiation of a molecule located near the nanoparticle can be increased and decreased compared to the rate of spontaneous radiation in vacuum.

This fact is one of the manifestations of the Purcell effect. The Purcell effect affects the functioning of nanolasers (spasers), causing a significant redistribution of radiation – suppression of certain modes and amplification of others. This leads to an essential change in parameters of the nanolaser generation. Because of the