



Fig. 1. (a) Cyclic voltammetries of 1.0 mM solutions of D- and L-Tyr enantiomers in Britton-Robinson buffer solution of pH 2.10 on bare GPE and GPE modified by cyanuric acid at 100 mVs^{-1} . (b) Nyquist plots and equivalent circuit in 1.0 mM solutions of D- and L-Tyr enantiomers. Inset: the equivalent circuit used to model impedance data.

Thus the electrical conductivity of graphitized carbon black paste electrode modified by self-assembled supramolecules of cyanuric acid was studied using electrochemical impedance spectroscopy. The disadvantage of an electrode modifier is an increase in resistance, and advantage it allows the determination of tyrosine enantiomers.

This work was performed under the support of the Russian Science Foundation: grant № 16-13-10257

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SORPTION AND PHOTOCATALYTIC TiO_2 PROPERTIES

Titanium (IV) oxide (TiO_2) has been widely studied as a unique material that can be effectively used in heterogeneous photocatalysis to remove organic contaminants from water [1,2]. As sorption is one of the important stages of the photocatalytic process it is crucial to investigate sorption properties of materials and develop synthesis methods that allow obtaining of catalysts with required properties.

TiO₂ sample was obtained by hydrolytic method as described in [1,2]. Briefly, TiO₂ nanopowder was prepared using hydrolysis in aqueous and alcohol solutions by mixing water and Titania precursor at ratio 5 to 1. For the synthesis the mixture of reagents was heated up to 95 °C under continuous stirring and then kept for 40 minutes. The obtained precipitate was dried in an oven at 80 °C for 6 hours and then ground in mortar.

In this study, we investigated adsorption characteristics and photocatalytic activity of the obtained nanomaterial. Method of nitrogen adsorption/desorption was used in order to evaluate BET specific surface area of the synthesized nanopowder ($S_{\text{BET}} = 199,4 \text{ m}^2/\text{g}$). Degradation rate of methylene blue (MB) model solution (cationic organic dye) under UV irradiation was used to determine photocatalytic activity of the TiO₂ sample. It was found that the synthesized TiO₂ sample was highly active and allowed 90% discoloration of the model dye solution under the experimental conditions (MB solution concentration – 10 mg/L, MB solution volume – 50 mL, photocatalyst dose – 50 mg, UV irradiation time – 20 min).

The obtained results demonstrate great dependence of catalytic activity on the structural and adsorption properties of the material, namely, specific surface area. The results also suggest that it is crucial to synthesize nanomaterials with highly developed morphology and therefore with large specific surface area for application in heterogeneous photocatalysis.

REFERENCES

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THE STUDY OF COPPER REMOVAL BY ACTIVATED CARBON MODIFIED WITH RED MUD

In recent years, the wastewater treatment from heavy metal ions is an urgent environmental problem due to their biological resistance during biological treatment. Traditional technologies for water treatment from multi-component contaminants include chemical precipitation, advanced oxidation