USING DIRECT MODIFICATION FOR SYNTHESIS OF HUMIC DERIVATIVES WITH COMPETENT ELECTRODE POTENTIAL

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Chemical modification is a promising tool for preparing humic materials of the desired properties. In the context of remediation technologies, to the most important properties of humic substances (HS) belongs ability for taking part in redox-processes. This property is provided mainly by quinoic moieties in humic backbone. Range of redox-processes in which HS can take part and their thermodynamic parameters are determined by electrode potential of HS. Electrode potential of HS relates to structure and surroundings of quinoic moieties in their backbone. Hence it is possible to regulate electrode potential of HS lerivatives by their direct modification by quinones of given structure and electrochemical properties.

The goals of this research were to synthesize HS modified by hydroquinone, methylhydroquinone and 2,3-dimethylhydroquinone, to determinate electrode potentials of the derivatives and to reveal relation between the structures of quinones and electrode potentials of derivatives.

Reaction of oxidative polymerization of quinones initiated by Fenton reagent was used for modification. Polymerization was conducted at pH 9.5 during 4 hours. Acidity of the reaction mixture was adjusted by concentrated solution of KOH. Redox-titration technique by iodine described in[1] was used for determination of electrode potential of quinones and derivatives.

Results of investigation showed that electrode potential of humic derivatives increases with increasing of electrode potential of quinones used for modification.

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References

1. Struyk Z., Sposito G. Redox properties of standard humic acids. *Geoderma*, 2001, **102**, 329.