

Features of Influence of Humic Acids on Determination of Volatile Phenols in Natural Waters

S.A. Dolenko*, H.M. Kravchenko, G.N. Pshinko

A.V. Dumansky Institute of Colloid and Water Chemistry of NAS of Ukraine; 42 Acad. Vernadskoho Blvd., 03680, Kyiv, Ukraine; *e-mail: sdolenko@ukr.net

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The effect of the solution acidity and the duration of its storage on phenol and o-cresol recovery from model solutions was studied in the absence and in the presence of humic acids. It was shown that in the absence of humic acids phenol recovery decreases with storage time up to 70% (at pH 4) and up to 40% (pH 5.8). For phenol solutions with pH 5.8 the recovery sharply decrease after 3 days of storage, while for the solutions with pH 4, it is maintained at $(93 \pm 3)\%$ for 7 days. Low concentration of fulvic acids (up to $1.0 \text{ mg} \cdot \text{L}^{-1}$) keeps phenol recovery at level of $(93 \pm 2)\%$ during 21 days, even at pH 5.8. Increasing the concentration of humic acid reduces recovery of phenols. It is interesting to note that the reduction of o-cresol recovery observed at significantly lower concentrations of humic acid. After 3 days of storage, $0.8 \text{ mg} \cdot \text{L}^{-1}$ of humic acid reduces o-cresol recovery to 10%, while $4.8 \text{ mg} \cdot \text{L}^{-1}$ of the stabilizer reduces phenol recovery to 65% only. We assumed that reduced recovery phenols in the present of humic acids are due to their ability to bind the organic compounds. To confirm the effect of binding, the magnetic treatment of model solutions was performed at constant magnetic field power $(40 \pm 10) \text{ mT}$. It has been shown that the decrease of the recovery in the presence of humic acid has reversible character. After the magnetic treatment of the solution at pH 5-9 the recovery increases from 10-15% to 85-95% for phenol and from 7-12% to 55-95% for cresol.

Keywords: humic acid, fulvic acid, volatile phenols, fluorimetric determination, magnetic treatment
