

THE ROLE OF VARIOUS FRACTIONS OF HUMIC SUBSTANCES FROM SURFACE WATER IN BINDING Al(III), Fe(III), AND Cu(II) INTO COMPLEXES

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Abstract. The aim of this research work was to evaluate the role of various fractions of humic substances (HS) in binding Al(III), Fe(III) and Cu(II) ions into complexes using gel chromatography. With an increase in HS concentration in Ukraine's surface water bodies, the share of HS' fraction with a molecular weight of 20–5 kDa increases from 37% to 59%. In the water bodies under study the HS' fractions with molecular weight 20–5 kDa and < 1 kDa play a principal role in the studied metals' migration. HS with molecular weight 20–5 kDa have been found to bind the smallest amount of Al(III), Fe(III) and Cu(II) in complexes, if the metals concentration bound by 1 mg fraction of HS with a certain molecular weight is calculated. Experimental results showed that, the investigated metal ions have the ability to bind into complexes mainly by HS with a molecular weight of >20 and <1 kDa. In the water bodies under study 1 mg of humic acids has a greater binding ability in relation to Al(III), Fe(III) and Cu(II) ions than 1 mg of fulvic acids. Fulvic acids and humic acids with a molecular weight of 20–5 kDa also have the lowest binding ability.

Keywords: water body, humic substance, metal, binding ability, molecular weight distribution.

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