

Ultraviolet absorbance titration for the determination of complexing capacities and stability constants of copper (II)-fulvic Acid

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This work describes a quantitative method for the determination of DOM complexing properties (complexing capacities: C_L ; conditional stability constants: $\text{Log } K$) with copper (II) using ultraviolet (UV) absorbance titration technique. Two fulvic acids, from a landfill leachate of Guiyang City and surface water of Lake Baihua, and L-tyrosine were chosen in the model experiments. The UV absorbance of FA gradually increased with the addition of copper (II). Similar to fluorescence quenching titration technique, analysis of the data and fitting to the 1:1 metal:ligand model theoretical equation by a linear computer program results in the best fit K and C_L . Titrations of the model compound L-tyrosine proved the validity of this technique. The average C_L value was within 7.4% of the experimental concentration and the average K value was within 0.14% of the theoretical value under the conditions used. Absorbance titration results for FAs with Cu (II) at pH=6.0 and 7.0 compared well with those from fluorescence quenching titration. The results show that absorbance titration is a simple and quick technique for the calculation of humic substance binding ability with metals such as copper (II). We are currently studying the application of this technique to the binding of other metal ions e. g. Hg with DOM of different origins.