

KINETICS OF CADMIUM-FULVIC ACID COMPLEXATION

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ABSTRACT

The Cd^{2+} -MFA complexation kinetics was described by a series of parallel reactions yielding overall rate as $k_{obs}[Cd(H_2O)_6^{2+}][H_3L]$. Here, k_{obs} is a quadratic function of $1/[H^+]$.

INTRODUCTION

Aim of this research was to quantify metal-organic interactions over a range of experimental conditions that are important environmentally. Fulvic acids extracted from Maturajawela Peat Bog, Sri Lanka [Dissanayake, *et al.*, 1982] and cadmium as a model trace element were chosen for this investigation. This selection was made due to following reasons: (a). The mechanistic interpretations of interactions of Cd-organic polymer are incomplete to date. (b). Cadmium is a toxic element, hence its fate determination in natural systems is an important environmental issue (c). When compared to humic acids, fulvic acids play an extremely important role in transport of trace metals due to its low molecular masses, large number of functional groups, and greater solubility [Morel & Hering, 1993; Buffle *et al.*, 1990].

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MATERIALS AND METHODS

Maturajawela Fulvic acid (hereafter designated as MFA) was extracted according the International Humic Substances Society [IHSS] protocols. The initial Cd^{2+} concentrations were varied between 90 μ M and 600 μ M. The initial M-fulvic acid concentration was changed between 0.5 to 3 mg/L. A pre-determined quantity of M-FA, 4 ml of 5M $NaNO_3$ ionic strength adjuster, and 16 ml of distilled water were pipetted into a thermostat reaction cell. The auto-analyzer was programmed to register the potential of the cell at 60