

## Metal-binding organic macromolecules in soil: 2. characterization of the maximum binding ability of the macromolecules

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An experimental technique was devised to measure the maximum binding ability (MBA) of any macromolecule having electron donor groups. It is a dialysis technique wherein polymer portions are isolated in dialysis bags and equilibrated with metal-ion solutions of increasing concentrations. The excess of free metal ions is removed by repeated changes of distilled water. The device proposed allows one to run 12 or more samples simultaneously. By this procedure the amount of metal ions attached to the macromolecules as a function of the metal-ion concentration of the equilibrium solution is measured. Plotting the amount of metal bound to 1 mg of the polymer vs. free-metal concentration at equilibrium gives Langmuir isotherm-like curves. Therefore, to calculate MBA the linear Langmuir plot is applied. The limitation and applicability of the Langmuir isotherm is discussed. The Ca(II), Mg(II), Cu(II), and Zn(II) MBA of microbial humic acid-like polymers synthesized by *Stachybotrys atra*, Henders