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## Kinetic parameters of adsorption of pesticides in an organic matrix with agro-industrial and lignocellulosic residues for a bio-purification system

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Bio-purification system is used to adsorb and degrade pesticide spills during handling of products before its application. The BPBS has an organic matrix (biomix) composed of soil, commercial peat and wheat straw (1:1:2). We evaluated the adsorption capacity of different agro-industrial and lignocellulosic residues, as components of the biomix of the BPS, to treat water contaminated with pesticides. Sawdust, barley husk, compost and biochar were used in this process. Each biomix and individual components were characterized, and biomixes were formulated with partial replacement of 50% wheat straw or peat, moistened at 60-70% water holding capacity (WHC) and pre-incubated for 30 days at 20-25 °C. For kinetic studies, biomixes were contaminated with atrazine (ATZ), chlorpyrifos (CHL) and iprodione (IPR) at a concentration of 5 mg/L and to attain ionic strength, 0.01 M CaCl<sub>2</sub> was added to it. Adsorption at 30, 60, 300, 600, 1080 and 1140 min of incubation at 22 ± 1 °C was evaluated. The adsorption isotherms were carried out with different amounts of biomix and concentration of pesticides for 24 hrs. It was observed that the highest adsorption capacity was achieved in biochar based biomixes, independent of the type of pesticide. CHL presents the highest adsorption rate, ATZ presents a constant and linear saturation for other biomixes not presenting greater difference, and IPR differs its adsorption for each particular biomix. The Freundlich and Langmuir models were used to describe the kinetics of the adsorption process in the biomixes.

### Biography

M Cristina Diez has completed her PhD in 1993 at Universidad Estadual de Campinas, Brazil. She is a Professor in Chemical Engineering Department and, the Director of Biotechnological Research Center Applied to the Environment (CIBAMA-BIOREN) of La Frontera University. She has published more than 115 papers in reputed journals. She is a member of FONDECYT's technology board. She is serving as an Editorial Board Member of the *Journal of Soil Science and Plant Nutrition*.

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