



## Evaluation of the retention capacity of Pb and Cu in technosoils of Sustainable Urban Drainage Systems (SUDs) in Bogota, Colombia

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Recently, cities growth has enhanced economic development but also generates different problems that affect the population such as stormwater drainage. It is known that the area available for water infiltration decrease in these urban centers generating scenarios of high vulnerability and risk of flooding associated with extreme weather events of precipitation. Therefore, an alternative is the implementation of Sustainable Urban Drainage systems (SUDs) that allows high efficiency in the control and local infiltration of rainwater. SUDs are often built with technosoils from the recycling of materials from different industries, for which it is necessary to study their hydraulic and solute retention properties. Indeed, one of the functions of SUDs must therefore be the retention of pollutants before they reach the groundwater. Therefore, this research aimed to evaluate the retention capacity of metallic solutes Pb and Cu in technosoils (compacted mixture of sand, loam and rice husk ash) proposed for SUDs in Bogota, Colombia. A research work was conducted by combining adsorption isotherms measurements, unsaturated column breakthrough flow experiments and numerical modeling with RETC, STANMOD and HYDRUS 1D models. Adsorption isotherm can be described satisfactorily using the Freundlich and Langmuir models. Additionally, unsaturated soil column leaching tests (ISO/TS S1268-3) allows estimation of solute diffusion through the soil profile. A multi-reaction model (MRM) and convection dispersion flow model reveal non-linear and non-equilibrium in the movement of solute in soil. Moreover, there is a competition for adsorption of metal ions in the technosoil profile; the order of selectivity of heavy metals in the active sites of the microporal network will be  $Pb^{+2} > Cu^{+2}$ , so that these technosoil is a favorable material in heavy metals retention.

