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## Cr(VI) transport in typical soils of the North of Portugal

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Heavy metals are being added to the environment by atmospheric deposition and by fertilizers, sludge and sewage sludge application to the soil. The fate and movement of these contaminants depend on the physical and chemical properties of the solid and liquid phases that are in contact with each other. Generally, batch experiments are used to obtain equilibrium adsorption isotherms and to evaluate the soil sorption capacity of any given contaminant in an aqueous phase. However, in addition to adsorption, advection and dispersion may occur in dynamic systems justifying the need of flow experiments. Due to its mobility in the environment, its harmful effects on humans and its large usage among Portuguese industry, the behaviour and transport of hexavalent chromium, at different pH values of the aqueous solution, have been the aim of this study. A sample of a loamy sand soil collected in Oporto, Portugal (41º25'15.58"N and 8º45'58.27"O), was submitted to batch experiments and to flow experiments in column tests, at pH values of 2, 5 and 7. Kinetic, equilibrium adsorption and hydrodynamic parameters were evaluated and compared between systems. Sorption of hexavalent chromium was described using Freundlich and Linear isotherms, whereas transport was described as a convection - dispersion process, and characterized by a retardation factor. A nonreactive tracer was used to evaluate the dispersion coefficient independently. The kinetic rate coefficient was also evaluated for batch and dynamic systems. The retardation value, $R$, showed that hexavalent chromium is less mobile when the contaminant solution pH is higher. Moreover it has been found that the $R$ values obtained by the convective-dispersive equation fitting are lower than those determined by the linear isotherm and very similar to those obtained by the Freundlich isotherm.