COMPETITIVE SORPTION OF Cs\textsuperscript{+}, Sr\textsuperscript{2+}, Cu\textsuperscript{2+} IONS FROM AQUEOUS SOLUTION ONTO SILICA SAND

Francesca GIACOBBO\textsuperscript{1}, Mario MARIANI\textsuperscript{1}, Sonia MORANDI\textsuperscript{1}, Mirko DA ROS\textsuperscript{1}, Massimo ODDONE\textsuperscript{2}

\textsuperscript{1}Dipartimento di Energia, Sezione Nucleare, Politecnico di Milano, Via Ponzio 34/3, 20133 Milano (Italy).
\textsuperscript{2}Dipartimento di Chimica Generale, Università di Pavia, Via Taramelli 12, 27100 Pavia (Italy).

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The migration through surface and deep waters of pollutant agents coming from agricultural, industry and nuclear activities is more and more recognized as an important environmental problem. In the contest of an eco-sustainable development, it is of great importance the study and the modelling of the phenomena that govern migration processes of pollutants in groundwater. The major part of the pollutants present in groundwater interacts strongly with soils and aquifer rocks. For this reason, pollutants sorption processes onto porous matrix are of general interest in hydrology and in the frame of confinement of industrial and domestic wastes as well as in geological disposal of high-level nuclear waste.

In this study, kinetic and equilibrium, mono-component and multi-component, batch experiments were carried out in order to: i) study the influence of metal concentration and contact time on sorption onto silica sand of some safety-relevant metal ions in aqueous solution, such as Cs\textsuperscript{+}, Sr\textsuperscript{2+}, Cu\textsuperscript{2+}, and ii) investigate competitive sorption processes. Two series of tests were performed: Series I: with equal, molar, concentration of metal; Series II: with equal, ppm, concentration of metal ions. Metal ions concentrations in aqueous solutions were determined by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) measurement technique.

Sorption data were fitted with Linear, Langmuir and Freundlich models. The amount of each ion uptake observed in multi-component batch tests was compared with the corresponding uptake observed in mono-component batch tests and correlated to the equilibrium time of the ions present in solution. Multi-component tests show that the uptake of each ion is reduced in presence of other ions in solution and that competition between species appears influenced by the equilibrium times of the single species in solution and by pH. In particular the adsorption of species characterized by the longest equilibrium times seems much more influenced by the presence of the other species in solution.