Postdoctoral position - 24 months

Starting date: Ideally December 1st 2016 Lab: CEREGE (Aix-en-provence) and IPSEN Society Funding: IPSEN Society

Context:

Clays are used in many materials and particularly used for anti-acidic properties. The sources of clays and above all the beidellitic clays are not pure and contain minor quantities of metallic oxides with traces of metals and metalloids.

Aim of the Project:

In this context, this project aims at developing an innovative process in order to dissolve the metal oxide phases which contain traces of Pb and As. The approach will be divided in three parts: 1- the study of the true speciation of the traces of Pb and As present within the metal oxides. This study will be made in CEREGE using a combination of various techniques such as X-ray microfluorescence and also X-ray Absorption Spectroscopy at a synchrotron facility. The CEREGE team has a strong experience in collecting and analyzing such data; 2- optimize at the laboratory scale the dissolution of the metal oxides containing traces of Pb and As with a mixture of organic molecules by favoring their interactions with the metallic oxide phases incorporated in the clay aggregates. The techniques used will be the ICP-MS and laser diffraction helping to calculate the fractal dimension of the aggregates with time and chemical composition of the organics used; 3- the previous data will be evaluated at a pilot scale in the IPSEN factory during approximately one year but with the necessity to analyze some key parameters using technics present at CEREGE lab to validate the results obtained at pilot scale with those at laboratory scale.

Required skills

A good knowledge of physico-chemistry of mineral materials as metallic oxides is required as well as chemical engineering skills and particularly the development of technologies using pilot scale combining chemistry, fluid mechanics and some separation technologies in order to validate the data obtained at the micro scale. Finally, recommendation letters are strongly recommended.

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