

## Two-years Open Post-Doctoral position in Nantes (France)

**Job description :** Solid-state NMR characterisation of treated clays

### **Project details :**

The job takes place in the frame of the well-established three years old collaboration between the LCPC (Laboratoire Central des Ponts et Chaussées) and the IMN (Institut des Matériaux Jean Rouxel UMR CNRS 6502). The global goal is a better understanding of the change of macroscopic mechanical properties of soils after treatment with additives (lime or cement) commonly used in earthworks and civil engineering. This implies to understand precisely the effect of the lime or cement on the soil minerals. In this frame, we are specifically embarked in the precise characterization and a mechanistic description of the reactants and products involved in relation to the preparation conditions and the geotechnical properties of the treated soils. We apply various techniques combining a global approach as X-ray diffraction, Thermal Analysis and spectroscopies as IR, Raman and solid-state NMR. Moreover, Scanning and Transmission Electron microscopies are also used for microstructural and morphological characterization of the soils and minerals.

The candidate will focus his attention on the solid-state NMR approach ( $^1\text{H}$ ,  $^{29}\text{Si}$ ,  $^{27}\text{Al}$ ,  $^{23}\text{Na}$  nuclei ...). The samples to be characterised are lime, cement or mixed -treated clays prepared in various conditions (curing time, temperature, water content). Clay samples include kaolinite, smectite as well as mica families. Moreover, the selected candidate will interact with all others people involved in the project to discuss and match data.

The candidate should be chemist with high solid-state NMR skills. He should be able to conduct advanced experiments and analyses by himself. Experiments will be performed on 300 MHz and 500 MHz spectrometers. If needed, access to higher fields is possible.

### **Information / Application :**

The duration of the contract is 2 years and the estimated net salary per month 2000 €.

For further information or for written applications, including curriculum vitae, summary of research interest and experience, please contact :

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