Postdoc fellowship on reactive convective dissolution

**Description**

The Nonlinear Physical Chemistry Unit (NLPC) of the Université libre de Bruxelles (ULB) invites applications for one *Postdoc fellowship to begin in September 2017* or soon after.

The objective of the research is to analyze the influence of chemical reactions on convective dissolution of CO$_2$ in saline aquifers. To mitigate the increase of atmospheric concentrations of CO$_2$, carbon sequestration techniques aim to capture this greenhouse gas at the exit of exhaust plants and inject it into geological formations like saline aquifers. To be able to predict the amount of CO$_2$ that can be stored in a given aquifer, it is important to be able to evaluate the flux of gas dissolving in the aqueous phase as a function of the chemical composition of the host solution. To gain insight into this problem, our group conducts both experiments on laboratory-scale Hele-Shaw set-ups and numerical simulations of reaction-diffusion-convection models. We seek a motivated candidate to join the group working on this subject. We encourage both experimentalists and theoreticians to apply.

**Type of appointment**

One year full time postdoc fellowship. Approximately 2300 € net per month.

The successful candidate must hold a PhD degree since less than 8 years and not have been employed or have lived in Belgium more than 24 months in the last 3 years.

**Required Qualifications**

PhD in Chemistry, Physics, Mathematics, Engineering or related fields. Good oral and written communication skills (in English) to work in a multidisciplinary team environment. Ability to write scientific publications and deliver scientific presentations in English.

**Contact Persons**

Prof. Anne De Wit and Prof. Laurence Rongy
Université libre de Bruxelles (ULB), Nonlinear Physical Chemistry Unit
Campus de la Plaine, CP – 231, Boulevard du Triomphe, B-1050 Bruxelles, Belgium
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**Application Procedure**

Applicants should submit a cover letter including a statement of interest, a curriculum vitae and the name and address of two persons of reference via email to both A. De Wit and L. Rongy. Deadline for application: June 30th, 2017.

**Project summary**

Research performed at NLPC focuses on the experimental and theoretical study of spatio-temporal patterns and dynamics emerging from the coupling between chemical reactions and hydrodynamic flows. The research to be developed in the context of this fellowship aims
to study the effect of chemical reactions on convective dissolution of CO$_2$ in solutions containing given chemical reactants. Depending on qualifications, the successful candidate will contribute either to the experimental or theoretical part of the project or to both approaches.

The experimental study will characterize the properties of buoyancy-driven fingering developing in reactive aqueous solutions upon dissolution of gaseous CO$_2$ from above. Good knowledge of schlieren optical devices and good programming skills to post-process and analyze experimental data through image analysis are an advantage.

The numerical approach will consist in integrating numerically a reaction-diffusion-convection model of convective dissolution using an in-house available code. Expertise in simulations of hydrodynamic instabilities is an asset.