

PhD in Experimental Geochemistry and Reactive Transport

We invite applications at the Geosciences Environment Toulouse laboratory (<https://www.get.omp.eu/en/geosciences-environnement-toulouse-en/>), University Paul Sabatier (Toulouse, France) for a PhD position in geochemistry and reactive transport in porous media.

We are seeking a PhD student to participate in the Carnot ISIFOR project Microtransphasique: reactive transport & multiphase flow in micromodels. The project explores reorganization of flow and transport due to mineral reactivity. Indeed, mineral reactivity [1] induced by geochemical fluid can quickly alter the flow and transport properties in reservoir rocks, as the fluid-mineral interfaces move through time [2]. Observations on single crystals have already pointed at the heterogeneous shift of the interfaces [3,4], which is driven by the coupling between chemical reactions and local transport, but also depends on the intrinsic properties of the reacting mineral. The project will explore the role of dissolution/precipitation processes on the evolution of these properties, through an experimental and modeling approach. The project will involve design of experiments, analyze of fluids and solids with a variety of techniques, image processing, and numerical modelling of flow and transport [3,4].

We are interested in candidates with a MSc. In Earth Sciences, Environmental Chemistry or related field. The applicant will have a background in geochemistry, fluid chemistry, oil and gas engineering, environmental sciences and/or fluid mechanics, and will be keen in developing experimental work and/or numerical modeling using cutting-edge tools. They should have the ability to teamwork, synthesizing, and demonstrate scientific curiosity

The position is opened by the doctoral school SDU2E to competition for funding (<https://adum.fr/as/ed/page.pl?site=sdu2e&page=candidater>). The recruitment is a three-step process: 1. Evaluation of the candidate by the PhD advisor, 2. Application on the dedicated website of the Doctoral School (by May 12), 3. Interview by the scientific committee of the Doctoral School (June 5-9).

The position, named Doctoral School contract, will be fully funded for 3D years, starting Fall 2023.

Gross salary is 2000€/month; possibility to teach at the university (French mandatory) on demand.

Please contact Dr Catherine Noiriél (Catherine.noiriél@get.omp.eu) if you have questions regarding the position or the recruitment process. Submit a CV, including research interest letter (max 2 pages), if possible Master grades and ranking, and two referees by email to Dr Catherine Noiriél by May, 5, 2023.

Références:

- [1] Noiriél C., and Daval D. (2017) Pore-scale geochemical reactivity associated with CO₂ storage: new frontiers at the fluid-solid interface. *Accounts of Chemical Research*, vol 50, n°4, p. 759–768, DOI: 10.1021/acs.accounts.7b00019
- [2] Noiriél C., Oursin M., and Daval D. (2020) Examination of crystal dissolution in 3D: a way to reconcile dissolution rates in the laboratory? *Geochimica & Cosmochimica Acta*, 273, 1-25, DOI: 10.1016/j.gca.2020.01.003
- [3] Soullaine C., Tchelepi H.A. (2016) Micro-continuum approach for pore-scale simulation of subsurface processes. *Transport in Porous Media* 113 (3), 431-456
- [4] Noiriél C. and Soullaine C. (2021) Pore-scale imaging and modelling of reactive flow in evolving porous media: tracking the dynamics of the fluid-rock interface, *Transport in Porous Media*, vol 140, n°1, 201-213, doi 10.1007/s11242-021-01613-2