

Séminaire de Pierpaolo Zuddas

Nom : Séminaire de Pierpaolo Zuddas

Titre : Quantification de la réactivité des minéraux en réponse aux perturbations naturelles du CO₂

Laboratoire :

Nom du conférencier :

Son affiliation :

Date et heure : 17-05-2019 13h00

Lieu : Salle Darcy - METIS - Jussieu - 46-56 - 3e étage

Résumé :

Understanding complex reactions between CO₂-rich water and rocks is fundamental for quantifying the carbon cycle. Earth's CO₂ degassing in hydrothermal fields integrates long-term consumption of the reactive surface area of the minerals involved in water rock interaction. We use the composition of CO₂-rich geothermal waters to estimate the reacting surface area (RSA) of minerals in a granite, responsible for the gradient in pCO₂ partial pressure observed in the field. The results show that the kinetic rates of mineral dissolution are not linear, as generally assumed. We found that the reactive surface areas of rock forming minerals in the granite are not constant over long-term interaction process, invalidating the assumptions intrinsic to predictive modelling of reactive CO₂ transport. In particular, the proportion of biotite/albite reactive surface area varies by 4 orders of magnitude for the range of pCO₂ gradient measured (6 orders of magnitude). The conservative estimation of the mineral's reactive surface area offered here may explain the correlations known between gas discharge and tectonic regimes, by the production of pathways resulting from the preferential dissolution of minerals that, by producing permeability variations, may connect the crust to earth surface.

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