

Post-doctoral position at University of Valencia, Spain.

Dear Colleagues,

I would like to bring your attention to a 1 + 1 years' post-doctoral position to be opened at the Extreme Conditions lab, University of Valencia, Spain. The project concerns the experimental study of the phase relations in carbonates and the adsorption of CO₂ in silica zeolites at high-pressure high-temperature conditions (see abstract below). This involves the use of diamond-anvil-cells, laser and resistive heating, Raman and IR spectroscopies and synchrotron x-ray diffraction techniques. See requested skills for potential candidates below. The starting date is planned in June, 2023.

For further details of the research group please visit: <https://extreme-carbonates.github.io/>

<https://www.researchgate.net/project/Exploring-the-formation-of-novel-carbonate-structures-at-extreme-P-T-conditions>

Please distribute this ad to all potential candidates. For further inquiries, feel free to contact me at: David.Santamaria@uv.es

Best regards,

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Abstract of the project

The structural stability and physical properties of carbonate phases at different thermodynamic conditions and chemical environments are questions of geophysical importance to be answered. The goal of our project is aimed at (i) the determination of phase relations in carbonates at geotherm conditions and (ii) the study of carbonation and carbon reduction processes at high pressures and temperatures, which will provide CO₂ chemical reactivity constraints. Such knowledge is seminal to constraining the carbonate phase relations in the Earth's interior, but it is also necessary input to design promising long-term carbon storage strategies.

This project is a joint experimental and theoretical effort that will shed light into the carbonation processes, map out the pressure-temperature-composition phase diagrams and search for novel dense carbonate materials. For this purpose, we will use cutting-edge techniques such as high-vacuum external resistive-heated and laser-heated diamond-anvil cells together with concurrent *in situ* characterization techniques, in both synchrotron and in-home facilities. Theoretical simulations will complement and delve into the nature of experimental observations.

Candidate requested skills

We are looking for a highly motivated candidate able to perform x-ray diffraction and spectroscopic (Raman and IR) measurements including data collection for minerals under pressure (and high temperature) and data analyses.

We expect a person:

- with PhD degree in crystallography, mineralogy, chemistry, physics or any related fields
- who demonstrated expertise in high pressure data collection
- with knowledge of crystallography and experience in conducting, evaluating and reporting of research in X-ray structural analysis
- with good knowledge of written and spoken English, written and spoken presentation skills
- with ability to work independently and within a team
- with excellent analytical and problem-solving skills
- with practical knowledge of writing scientific texts

Additional skills which are advantage:

- Practical knowledge of mineralogy and phase transitions in minerals
- practical experience in synchrotron facilities