

## The synthesis of actinide-based materials



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Actinide compounds often show complex magnetic structures and unique ground states. This behavior derives from the 5f strong spin-orbit coupling and the complex interactions between the 5f states and the states of the ligands. Theoretical work on actinide compounds is extensive and a great evolution in computational tools to calculate their electronic structure took place in recent times. However, the experimental work is still fundamental not only to confirm theory, but also to identify new exciting ground states and physical behaviors. Nevertheless, there is an increasing lack of experimental work in this field, which is related with the difficulties on handling such materials, that leads to the central issue of making good samples with the minimum quantities and efforts.

In this talk, a brief description of the main methods for the synthesis and crystal growth of actinide solid compounds is given. It will start with an introduction on the challenges on dealing with the preparation of such samples. It will continue stressing the importance of phase diagram studies for the identification of new compounds and delineation of the best preparation and crystal growth methods. Finally, the main methods for the synthesis and crystal growth of actinide solid compounds will be presented.

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