

***In-situ* Crystallization Cell: Developments and First Results of the Model System Al(acac)₃**

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In-situ investigations of the crystallization of solids are still necessary for the understanding and the rational synthesis of precursors, intermediates and products with special or even improved properties.^[1] With our crystallization cell,^[2] the detection and the control of different reaction parameters during chemical reactions in fluid media can be achieved. The modifications of the cell allow *in-situ* experiments with X-ray diffraction (XRD).^[2] The crystallization of Al(acac)₃ (acac = acetylacetonate) as model system was investigated to demonstrate the performance of the cell. First *in-situ* energy-dispersive X-ray diffraction (EDXRD) experiments were carried out at the beamline F3 (DORIS, DESY). During the crystallization of Al(acac)₃ changes of pH value and redox potential could be observed, but a higher concentrated reaction suspension was required for obtaining suitable EDXRD spectra. In subsequent *in-situ* XRD experiments at beamline P07B (PETRA III, DESY) with modified reaction vessels in a special sample holder (Fig. 1) the growth of the Bragg peaks during the crystallization of Al(acac)₃ could be detected. The possibility of integrating further methods and/or sensors is highly important while working with synchrotron radiation (Fig. 1). Hence, the potential of the cell was proved to be beneficial for controlling and monitoring several reaction parameters during the crystallization.

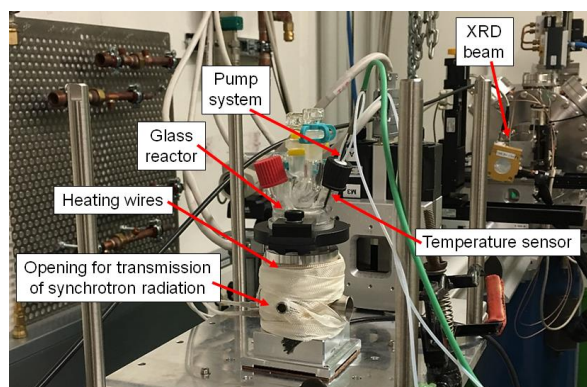


Figure 1. Setup of the modified reaction vessel in the sample holder at the beamline P07B at PETRA III, DESY.

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