(102-516) - Microstructural Characterization of UF4 by High-Resolution Synchrotron Diffraction

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During the production of the fuel element for the nuclear reactor IEA-R1, uranium tetrafluoride (UF4) is obtained from a humid route of uranyl fluoride (UO2F2) reduction with stannous chloride (SnCl2), and subsequent dehydration. Once the efficiency of the magnesiothermic reduction process has a large dependence on the UF4 characteristics, a well-defined characterization of this material is essential. Accordingly, six samples of UF4, produced with different process parameters were analysed by synchrotron radiation x-ray diffraction in high-resolution configuration. Although UF4 samples do not exhibit high symmetry, the spectra obtained allowed a good refinement of data using the Rietveld method, and revealed a correlation of process parameters and crystal structure.