**MS40 Operando and in-situ crystallographic studies**

**MS40-1-7 Low-temperature study in the mixed crystal series Ni_{1-x}Cu_xCr_2O_4**

#MS40-1-7

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**Abstract**

Members of the mixed crystal series Ni_{1-x}Cu_xCr_2O_4 crystallize in a distorted spinel structure [1,2,3]. For the end members NiCr_2O_4 and CuCr_2O_4 strong Jahn-Teller activities on the Ni^{2+} and Cu^{2+} ions at the A site lead to an elongation and a flattening of the NiO_4 and CuO_4 tetrahedra, respectively. Two structural phase transitions where caused by the local distortion, where the crystal structure first undergoes a change from cubic (Fd3m) to tetragonal symmetry (I41/amd) followed by a change to orthorhombic space group Fddd at or below room temperature, depending on the Cu-Ni substitution. Low-temperature X-ray diffraction by means of a Guinier diffractometer, hosted at the HZB X-ray Corelab, was applied in combination with neutron powder diffraction data to elucidate the interplay between structural and magnetic distortion in the complex spinel system.

**References**


**Lattice parameters of Ni0.82Cu0.18Cr2O4**

![Lattice parameters graph](image1)

**Low-temperature Guinier diffractometer**

![Guinier diffractometer](image2)

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