## Low Temperature Structures of the Metal Oxyhalides MOX: M =Ti, V and X =Cl, Br

Andreas Schönleber<sup>a</sup>, Lukáš Palatinus<sup>a,b</sup>, Mohammad Shaz<sup>a,c</sup>, Sander van Smaalen<sup>a</sup>, <sup>a</sup>Laboratory of Crystallography, University of Bayreuth, Bayreuth, Germany. <sup>b</sup>Institute of Physics, Academy of Sciences of the Czech Republic, Prague, Czechia. <sup>c</sup>Department of Physics, Banaras Hindu University, Varanasi, India. E-mail: andreas.schoenleber@uni-bayreuth.de

The metal(III) oxyhalides MOX structures with M = Ti, V and X = Cl, Br [1] are isostructural with FeOCl at room temperature: they are built by slabs consisting of a  $M_2O_2$  bilayers enclosed by layers of X atoms. The symmetry is orthorhombic, space group *Pmmn*. In TiOCl and TiOBr two structural phase transitions have been observed in the magnetic properties upon cooling, suggesting the presence of a spin-Peierls state [2,3]. The low temperature phase is a twofold superstructure of the room temperature phase [4]. In VOCl only one phase transition is observed [5].

We have performed temperature dependent single crystal X-ray diffraction experiments down to T = 10 K, exploring the development of various superstructures in the low temperature and intermediate temperature phases of these compounds. The knowledge of the superstructures is important, because it might shed further light on the nature of the phase transitions in the *MOX* compounds.

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