

Abstract Submitted  
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**Chromium based Spinels under Compressions** YUEJIAN WANG, ILIAS EFTHIMIOPOULOS, Oakland University, THOMAS AHEARN, Oakland, VLADIMIR TSURKAN, JOACHIM DEISENHOFER, ALOIS LOIDL, University of Augsburg — The Chromium (Cr) based spinels,  $ACr_2X_4$ , represent a prototype system for the study of magnetism in solid [1]. More recently, multiferroicity has been found in members of this series [2]. However, the origin of the ferroic properties is not well understood; Given the strong interplay between structural and ferroic properties in this system, the structural evolution induced by pressure may shed light on the multiferroicity [3]. High-pressure X-ray diffraction and Raman spectroscopic studies have been conducted on  $ZnCr_2Se_4$  and  $ZnCr_2S_4$ . The study elucidated the phase transformation of these spinels under high pressures by the X-ray data and the complementary information from Raman spectra. In the meantime, the unit cell volumes as well as the lattice parameters versus pressures of each individual phase were illustrated, and the corresponding elastic moduli were obtained by the fitting of the second order Birch Murnaghan equation of state. Furthermore, the vibrational properties as well as the possible changes of electric and magnetic properties induced by the structural transitions were discussed.

[1] T. Rudolf *et al.*, N. J. Phys. 9, 27 (2007) and refs. therein

[2] S. Weber *et al.*, PRL 96, 157202 (2006)

[3] V. Gnezdilov *et al.*, PRB 84, 045106 (2011)

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