ESRF	**Experiment title:** High pressure powder diffraction onZNAL and MGFE-spinels	**Experiment number**: **CH-827**
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Shifts: 12	**Local contact(s)**: Dr. Michael HANFLAND	*Received at ESRF:*

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Report:

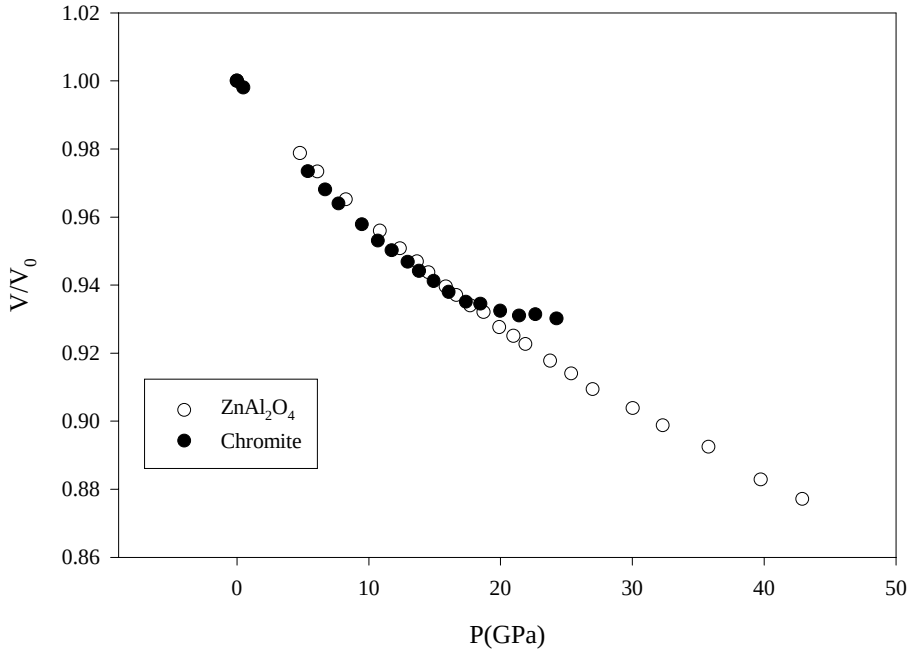
The high-pressure experiment has been performed on two different spine-like samples in order to determine the cation effect on the compressibility. These kinds of compounds are ideal to be studied at high-pressure for their high symmetry and quite simple structure: the two cations are distributed in an octahedral and a tetrahedral site. We have carry out the experiment on the synthetic $ZnAl_2O_4$ spinel and on a natural Chromite. The first sample has been chose to be related to $ZnFe_2O_4$ [1], while the second one to study the geological evolution of Chromite under ophiolitic matamorphirms.

Each sample has been loaded in two different Diamond Anvil Cells (DAC):

- a 250 μm cutlet DAC with methanol-ethanol mixture as pressure medium up to about 70 GPa.
- a 125 μm cutlet DAC with nitrogen as pressure medium up to about 350 GPa.

We have collected about 30 frames for each sample. The beamline characteristic was the ID9 high-pressure standard set-up: angle-disperse Guinier camera with a MAAR345 Imaging Plate. The pressure has been determined with a ruby fluorescence system. The 2-dimension diffracted patterns have been treated with FIT2D software [1] and the diffractograms have been refined with GSAS software [2].

The compression curves has been plotted in fig.1. The $ZnAl_2O_4$ is well behaviour up to 400 GPa, while the Chromite compression curve have a slope change above 200 GPa. Moreover the diffraction patterns present peak broadening and some new peaks are present at same pressure. The interpretation of this pressure effect is still under study.



The extracted *bulk modulii* by means of the Birch-Murneghan equation of state are K_0=199(5) GPa K'_0=7.9(4) for $ZnAl_2O_4$ and K_0=154(5) GPa K'_0=16(1).

These are preliminary results and more work will be done to better define compression parameters and correlate with our previous work on the high-pressure spinel crystal-chemistry. Moreover an intense work should be performed to define the peculiar chromite behaviour at high-pressure.