



	Experiment title: Structural phase transitions in NbSe ₂ crystals at high pressures up to 2Mbar and cryogenic temperatures.	Experiment number: HC-4448
Beamline: ID15B	Date of experiment: from: 07/07/21 to: 11/07/21	Date of report: 03/11/21
Shifts: 12	Local contact(s): Gaston Garbarino, Tomasz Poreba	<i>Received at ESRF:</i>
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Report:

The goal of the current proposal was to study the crystal structure, localize the cascade of structural and electronic phase transitions in the dichalcogenide NbSe₂ single crystals induced by high-pressure and cryogenic temperatures 4 – 300 K.

Single crystals of NbSe₂ and NbSe₂:Fe were loaded in two DACs. Two microcrystals with perpendicular orientations together with several ruby chips were loaded in each cell (Fig.1). Single crystal X-ray diffraction was used to study the crystal structure of these compounds down to 7 K and up to high pressure of 23 GPa.

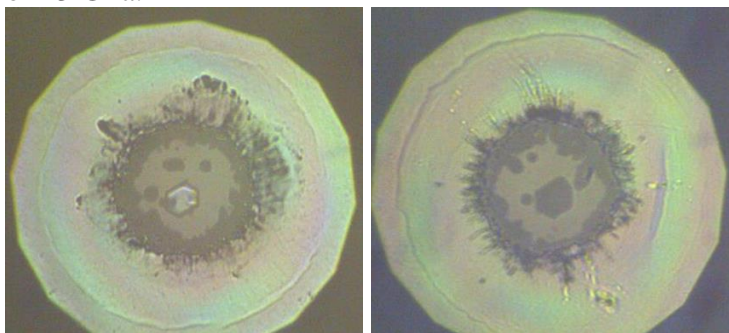


Fig.1. DAC with loaded samples. a) NbSe₂ crystals b) a) NbSe₂:Fe crystals

Preliminary analysis revealed the hexagonal crystal structure sp.gr. *P63/mmc* at ambient pressure and temperature. This structure didn't change significantly at low temperature of 7K where superconductivity emerges and up to pressure of 23 GPa. The detail analysis of the obtained diffractions patterns is in progress now.