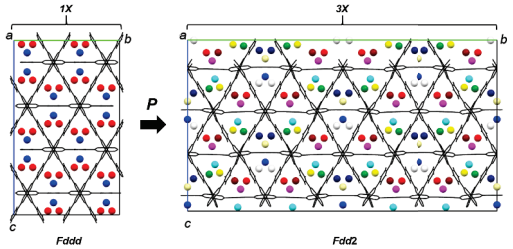

Figure 1. Upon application of pressure a transition to a previously unobserved phase of Sc_2BDC_3 is observed. The new phase has the b-axis of the ortho-*F* cell tripled and a rearrangement of the CH_4 adsorption sites.

Keywords: High-pressure crystallography, gas storage, nanoporous materials.

MS21. Advances in high-pressure methods

Chairs: Leonid Dubrovinsky, Ronald Miletich

MS21-O1 Extreme conditions beamline at Petra III, DESY: status and perspectives

Konstantin Glazyrin[1], Zuzana Konopkova[1], Wolfgang Morgenroth[1], Mario Wendt[1], Hanns-Peter Liermann[1]

1. DESY

email: lorcat@gmail.com

Fast evolution of applied and fundamental sciences requires probing of material properties in the space of pressure, temperature and time. Application of X-ray diffraction to the matter subjected to extreme conditions can lead to new fascinating discoveries and improve our understanding of physical phenomena on macro- and micro-scale. Diamond Anvil Cell (DAC) high pressure technique has de facto become a standard, and its development has made it possible to perform direct experimental tests of old and new scientific concepts previously considered as extremely challenging or even impossible. The constantly growing strong demand from different scientific communities stimulates large scale facilities to provide more and more stations either dedicated or stations capable to conduct high pressure studies a part of their operation time.

Extreme Conditions Beamline (ECB - P02.2) of Petra III, DESY, Hamburg, Germany, is dedicated to micro X-ray diffraction studies of matter (powder or single crystal) at simultaneous high-pressure and high/low-temperatures.

We review current capabilities of the beamline and provide a description of sample environments available to users for high-pressure studies conducted in the DAC (e.g. laser heating, cryostat, resistive heating and etc.). As an overview of our capabilities we present case studies and demonstrate results obtained at the beamline (geoscience, material science, etc.). Then, we discuss future plans to upgrade the beamline. Here, we highlight developments of single crystal diffraction at simultaneous high-pressure and high/low temperatures employing laser/resistive heated DAC as well as cryogenically cooled DACs. Finally, we discuss the possibility to conduct time resolved single crystal diffraction studies using partial or 'pink' Laue diffraction - a technique under commission at the ECB at the moment.

Keywords: X-ray diffraction, static compression, Petra III large scale facility,