ESRF	**Experiment title:** Bioinspired route to tuning the band-gap of semiconductor crystals by incorporated organic molecules: learning from nature	**Experiment number**: MA-2319
Beamline: ID22	**Date of experiment**: from: 30/10/2014 to: 03/11/2014	**Date of report**:
Shifts: 12	**Local contact(s)**: Dr. Andy Fitch	*Received at ESRF:*

Names and affiliations of applicants (* indicates experimentalists):

Prof. Boaz Pokroy and Anastasia Brif

Report:

1. Bio-Inspired Band Gap Engineering of Zinc Oxide by Intracrystalline Incorporation of Amino Acids

*Anastasia Brif, Guy Ankonina, Christina Drathen, and Boaz Pokroy**

Bandgap engineering of zinc oxide semiconductors can be achieved using a bio-inspired method. During a bioInspired crystallization process, incorporation of amino acids into the crystal structure of ZnO induces lattice strain that leads to linear bandgap shifts. This allows for fine tuning of the bandgap in a bio-inspired route.

Advanced Materials **2014, 26, 477–481**

2. Bio-inspired engineering of a zinc

oxide/amino acid composite: synchrotron microstructure study

Anastasia Brif, Leonid Bloch and Boaz Pokroy*

The presence of intracrystalline molecules has been shown to strongly influence crystallite size while at the same time producing strains in both synthetic and biogenic crystals. These molecules, when introduced into the ZnO lattice, alter the band-gap energy of the semiconductor. We carried out a high-resolution X-ray microstructure study utilizing synchrotron radiation of bio-inspired ZnO/amino acid composites. Analysis of the adherence profile of the amino acids to the ZnO host is important for achieving better control of the band- gap value of ZnO as a semiconductor.

CrystEngComm, 2014, 16, 3268–3273

We also studied the efefct amino acids have on the structure and band gap o Cu2O.