MS17-02 | High-Pressure Polymorphs of Organic Compounds with Interactions Involving Nitrogen Atoms

Olejniczak, Anna (Adam Mickiewicz University, Poznan, POL)

High-pressure can significantly influence the formation, transformations and properties of materials. Organic materials are attractive due to their easy production and disposal. Their structures and properties are often dominated by weak intermolecular interactions. They can be rearranged or broken at high pressure, and at the same time new types of intermolecular interaction can be formed. Weak intermolecular forces involving nitrogen atoms and their transformation at high-pressure conditions are particularly interesting, because they can form various interactions, such as hydrogen bonds, which play a significant role in biology, chemistry or medicine. Varied thermodynamic conditions can be required for the synthesis of new materials, their transformations or the formation of solvates. The new polymorphs and solvates usually have different properties than those of neat compounds.

Nitrogen atoms are presented in many important compounds, for example in 1,4-diazabicyclo[2.2.2]octane salts, exhibiting ferroelectric or relaxor properties; methylamines, which are widely used in organic chemistry and industry; urea, which is one of the most common chemical and biological compound, widely used in chemical practice and in industry, mainly for the production of fertilizers or pharmaceuticals; thiourea, which can be used as dyes, plant protection agents, pesticides, corrosion inhibitors; and high-nitrogen-contents compounds, which can be the components of medical drugs or exhibit explosive properties. The compression experiments on the nitrogen rich compounds will be presented.