

# Oral Contributions

[MS38-04] **The Effect Of Water On The Outcome Of Mechanical Treatment In L-Serine-Oxalic Acid System** E. A. Losev<sup>1,2</sup>, E.V. Boldyreva<sup>1,2</sup>

<sup>1</sup>*Institute of Solid State Chemistry and Mechanochemistry, Kutateladze, 18, Novosibirsk, 630128, Russia, e-mail: losev.88@mail.ru, eboldyreva@yahoo.com*

<sup>2</sup>*REC-008, Novosibirsk State University, Pirogova, 2, Novosibirsk, 630090, Russia.*

Mechanochemical synthesis of molecular functional materials is a hot topic. Mechanical treatment of molecular solids allows one to avoid the use of bulk solvent and to obtain new forms of compounds, which are difficult (or impossible) to synthesise by “classical solution chemistry”. The most discussed mechanisms of mechanochemical reactions are (1) surface diffusion via gas phase; (2) formation of eutectic phase; (3) formation of mobile amorphous state, or (4) interaction through the liquid phase (for example, in the case of liquid-assisted grinding). Investigation of the mechanisms of mechanochemical transformations could help to determine the optimal conditions of processes under consideration and to control the synthesis of desired product.

The aim of the present work was to study the “L-serine-oxalic acid” system under mechanical treatment. Both L-serine and oxalic acid can form the hydrates, and it was possible to study the effect of water in various forms (crystal water in either of hydrates or in both of them; liquid water added to solid anhydrous forms) on the outcome of mechanochemical reactions. Bis-L-serinium oxalate dihydrate ([L-serH]<sub>2</sub>[Ox]•2H<sub>2</sub>O) form II was formed, if crystal water was present in only component, and also preceded the crystallisation of [LserH]<sub>2</sub>[Ox]•2H<sub>2</sub>O form I, when liquid water was added. [L-serH]<sub>2</sub>[Ox]•2H<sub>2</sub>O form II could be produced also by mere mixing components preliminary separately ground, what indicates the possibility of salt formation without grinding of the

mixture. The formation of [LserH]<sub>2</sub>[Ox]•2H<sub>2</sub>O (form I and II) was observed under mechanical treatment at the temperature of liquid nitrogen as well, when no liquid water could be present in the system. The results are analyzed on the basis of X-ray powder diffraction and IR-spectroscopy data. The work was supported by the Russian Foundation for Basic Research (RFBR) (Grants No. 12-03-31663 mol-a, 11-03-00684-a, 10-03-00252-a), by grants from the Russian Ministry of Education and Science No. 14.B37.21.1093, NSH 4357.2010.3, NSH 221.2012.3., programs from RAS 54.38 and 24.38 and Ludo Frevel Crystallography Scholarship Award (2013).