

## Microsymposium

**MS92.O03**

### *Teaching in a Secondary School: Crystal Growth and Basics of Crystallography*

D. Rychkov<sup>1,2</sup>, E. Losev<sup>1,2</sup>, E. Boldyreva<sup>1,2</sup>

<sup>1</sup>Novosibirsk State University, REC-008, Novosibirsk, Russia, <sup>2</sup>Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia

Nowadays, secondary education provides a broad variety of different compulsory courses giving a solid basis for further student's progress at the university. However, there is an opinion that in this system we are losing the sense of adventures, discoveries and research. Now the main question is if we can efficiently combine compulsory subjects and open classrooms in order to support students in their self-realization needs and provoke interest in mundane school subjects. The educational course for pupils «Crystal Growth – from School Desk to Leading Scientific Research» began several years ago with close cooperation between Novosibirsk State University, the Institute of Solid State Chemistry and Mechanochemistry SB RAS and School #162 of Novosibirsk. The aim of the course is to provide further education in Chemistry and Crystallography via laboratory work and lectures, complementing the standard school program. We provide a targeted syllabus for students from 7 to 17 years old, covering related scientific topics starting from crystal symmetry to the basics of physical chemistry. Through close communication and interaction, pupils develop skills in growing crystals, paying particular attention to obtaining large single crystals of different substances. During the course, pupils crystallize more than 15 different substances using at least 5 different methods and their modifications. At the end of every year, the students are given the opportunity to carry out a personal project, calling on the new knowledge they have obtained from the course. Thus we can assume that an efficient program was developed and realized to support personal ideas and research for school students, based on compulsory subjects and modern experimental techniques. The work was supported by the grant of Dmitry Zimin Fund “Dynasty” “Entertaining Science for pupils” №DP-55/13, Development Program of University Student Association, NSU, App. №2012-PSO-225, City Hall grant for young scientists.

**Keywords:** teaching, crystal growth