

# Poster Presentations

## [MS41-P02] The Experience of Teaching Solid State Chemistry in a Secondary School. Example 1 – Isomorphism of Alums.

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Three years ago we started a special program in Secondary School №162 in Novosibirsk in order to increase the interest of pupils (grades 9-11) in natural sciences. This educational course titled “Crystal Growth – from School Desk to Leading Scientific Research” includes the fundamental of solid state chemistry and contains two parts: (i) lectures to introduce the pupils to the subject of solid state chemistry and crystallography and (ii) experimental work where pupils learn crystallisation techniques, study the physico-chemical properties of the solid state and grow crystals of various substances. Throughout the programme we do not dwell on the complexity of crystallography but aim to show how to grow beautiful colored crystals with perfect shape. With this in mind, the main purpose of this program is to capture the interest of the pupils. It is important to present all information in a popular way and communicate with the pupils at their level; that's why all teachers on our course are students and postgraduate students from the department of solid state chemistry at Novosibirsk State University. At the end of the year we offer children the opportunity to perform a final research project and present their results at the school section of the International Scientific Student Conference (ISSC) held annually in Novosibirsk.

This year the pupils made three oral presentations at the ISSC and one of them (Anna Medvedeva – the winner of ISSC 2013) was related to the

exploration of the phenomenon of isomorphism in the case of potassium and chrome alums. The experimental work and analysis of results were performed in one month.

Tasks for this work were to grow layered crystals of potassium and chromium alums, to grow alum with partial substitution of the ion and to understand the basic principles of isomorphism of this particular system. The basic method of crystal growth was as follows: seeds were grown and those of highest quality were used to grow larger crystals by suspension in a saturated solution. By conducting this research the pupil observed that isomorphism is possible only for crystals with near identical internal structure, that the rate of crystallisation strongly depends on the solubility of the substance and the number of the satellite crystals in vessel. An even more remarkable result was the growing of set of crystals with different colours as a consequence of chromium ions in the structure. Finally the pupil grew large layered crystals with an opaque crystal embedded inside a larger transparent one.

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