[MS41-P03] The Experience of Teaching Solid State Chemistry in a Secondary School. Example 2 – Growing crystals of pure metallic copper. Denis A. Rychkov [1,2], Evgeniy A. Losev [1,2], Alisa I. Ivanenko[1,2] , Elena V. Boldyreva [1,2]

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The educational course for pupils «Crystal Growth – from School Desk to Leading Scientific Research¬ was started several years ago in close cooperation between Novosibirsk State University, the Institute of Solid State Chemistry and Mechanochemistry SB RAS and School #162 of Novosibirsk. The idea for the course is to provide further education in Chemistry and Crystallography *via* laboratory work and lectures, complementing the standard school programme. We provide a targeted syllabus for students from 5th form to 11th form (i.e. the last year of secondary school), covering many aspects of related science starting from crystal symmetry to the basics of physical chemistry. Through close communication and interaction, pupils develop skills in different methods of growing crystals, paying particular attention to obtaining large monocrystals of different substances. In terms of the course, pupils crystallize more than 15 different substances with at least 5 different methods and their modifications. At the end of every year, the students are given the opportunity to carry out a project, calling on the new knowledge they have obtained from the course. Such a work was done this year by Dmitry Chudakov – a 9th form pupil of School #162 – who was awarded 3rd place for his presentation in the school section of the International Scientific Student Conference in Novosibirsk, Russia. The aim of the aforementioned study was to obtain crystals of pure metallic copper and to understand the influence of different system parameters on the process of crystal growth. The system was very straight forward and simple while remaining interesting for the pupil: successive layers of copper sulfate, sodium chloride, filter paper and a source of iron were submerged in a saturated solution of sodium chloride. The variables included the dispersions of sodium chloride and copper sulfate, the quantities of copper sulfate and sodium chloride and the available surface of the iron source. Experimental work was carried out over 2 weeks under the supervision of young scientist. All copper crystals obtained were extracted from the system, washed, dried, weighed and examined by microscopy. An exciting result was the occurrence of copper crystals displaying good faceting, which was clearly seen using optical microscopy. Another observation was the lack of influence certain parameters had on the result. In this study it was shown that the total amount of pure copper did not depend on the quantity of copper sulfate or its dispersion. The dispersion of salt does not influence the geometric parameters of the crystal. On the other hand, some changes in the system had dramatic effects on the results. The total amount of copper was strongly dependent on the available iron surface and the purity of the product correlated with the size of the separating sodium chloride layer.

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