s7.m4.p5 Improving crystal quality with a simple new technique for optimisation. E. Saridakis and N.E. Chayen* (*presenting author), *Division of Biomedical Sciences, Imperial College of Science, Technology and Medicine, London SW7 2AZ, U.K. e-mail: n.chayen@ic.ac.uk*
Keywords: crystallogenesis, protein crystallization, phase diagrams.

A simple method for growing protein crystals by controlling the crystallisation process in vapour diffusion is presented. Nucleation is a pre requisite and the first step to crystal growth, yet excess nucleation causes the production of a large number of small crystals instead of a smaller number of useful ones. The optimum conditions for crystal growth are those which allow growth without the production of further nuclei (metastable conditions). The aim is therefore to control crystal growth by separating the phases of nucleation and growth i.e. to start the process at conditions which induce nucleation and then, transfer the nuclei to metastable conditions.

In vapour diffusion this is achieved in the following way: the coverslips holding the hanging drops are transferred, after being incubated for an optimum time at conditions normally giving many small crystals, over reservoirs at concentrations which normally yield clear drops. Fewer, much larger (up to 10 fold) and better diffracting crystals are obtained when the incubation times are optimised, compared with conventional crystallization at similar conditions. This technique has so far succeeded in improving crystals of several model proteins including human serum albumin [1] and a protein which could not otherwise be crystallised.

[1] Saridakis E. and Chayen N.E. "Improving protein crystal quality by decoupling nucleation and growth in vapor diffusion." *Protein Science* (2000) 9, 755-757.

s7.m4.p6 Growth of Aventurine Crystals. I.B. Makhina, A.A. Mar'in, V. Khadzhi, *Russion Research Institute for the Synthesis of Minerals, Alexandrov, RUSSIA.*
Keywords: aventurine, growth, quartz.

Aventurine ornaments and non-precious jewelry is made of quartz containing small glistering scales of coloured minerals: hematite (red) or (green). We have obtained aventurine material where crystalline copper is the included mineral. Single crystals of aventurine have been grown in hydrothermal conditions in fluoride solutions containing compositions of two-valent copper. The copper inclusions are concentrated mainly about the seed zone. Usually they have the shapes of triangular or hexagonal plates or needles. To distribute them more uniformly in the bulk of the crystal the copper bearing dopant has been placed in a perforated container. The density of the glistering plates and their dimensions are functions of the nature of the dopant and of the rate of growth of the quartz.

Our synthetic aventurine has an attractive rose colour and glister and while not being an absolute analogue of the natural stone it would be certainly of an interest for jewelers.