s5.m1.o3 **Microstructures of Polygonal Serpentines from HRTEM Imaging, Electron Diffraction, and Simulation Data.** B. Devouard (1), A. Baronnet (2), *(1) Université Blaise Pascal, UMR-CNRS 6524, 5 rue Kessler, F-63038 Clermont-Fd, France, (2) CRMC2-CNRS, Campus de Luminy, Case 913, F-13288 Marseille, France*.
Keywords: electron crystallography, mineralogy.

Serpentines are layered silicates of ideal formula $Mg_3Si_2O_5(OH)_4$. Because of a missfit between the tetrahedral and octahedral sub-layers of the structure, they can display an extreme variety of flat, rolled, or modulated microstructures. Polygonal serpentines are tubular fibers with a polygonal section, each of the 15 or 30 sectors showing a flat, lizardite-like, structure. High resolution transmission electron microscopy (HRTEM) imaging, selected area electron diffraction (SAED) and simulations of the diffraction patterns are combined to further document the microstructures of the most widespread types of polygonal serpentines. The SAED simulations were obtained by numerical Fourier transforms of computer-generated Bravais-cell images of fiber sections.

Imaging, diffraction and simulation data are in aggreement with a model involving lateral continuity of the layered structure and a curvature (without inversion of the tetrahedral sheets) across the sector boundaries. This model is based on the one proposed by Baronnet *et al.*[1], and differs from sharp-boundary models by Chisholm[2, 3] (without inversion) and by Dodony[4, 5] (with inversion). Easy plastic deformation of fibrils with hollow cores suggests that glissile dislocation walls occupy sector boundaries. HRTEM imaging and SAED reveal that the stacking sequences of the layers in adjacent sectors are homogeneously sheared by b/3, for 30-sectored fibers as well as 15-sectored ones. Axial fivefold symmetry is confirmed for polygonal serpentines.

Streaked diffraction chords connecting Bragg's reflections are typical of any polygonal fibril. They are due to curved layers with constant curvature at sector boundaries, involving extra spacing and distorted H-bonds between the layers. This would be a peculiarity of polygonal serpentines compared to other rolled serpentine varieties.

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s5.m1.o4 **The investigation of structural defects in rare-earth yttrium aluminum garnets.** S.A. Smirnova. *Russion Research Institute for the Synthesis of Minerals Alexandrov, RUSSIA*
Keywords: defects.

Yttrium aluminum garnets with erbium, dysprosium, ytterbium and lutetium have been grown in vacuum from the melt by the horizontal method. These crystals had to be used in solid acoustoelectronics as sound conductors. The crystallooptical, the acoustic spectroscopy, X-ray topography and electron microscopy methods were used for crystals investigations.

It was found, that given crystal, having high structural perfectos, contained some defects such as: inclusions of foreign phases (orthoaluminate, corundum, molybdenum) unnormal birefringence, block structure, doped A-centers, dislocations. Defects foundation was caused by physical and chemical properties of starting components and the growth conditions, also by the growth mechanism of the crystals.

It was shown, that the most important deposit to the formation of rest acoustic losses could be explained by A-centers, mosaic structure and the wrong crystallographic crystal orientation.