Seven new Ba borates, namely $\text{Ba}_3[\text{B}_9\text{O}_{20}\text{Cl}_2\text{OH}_2\text{H}_2\text{O}]$ (I), $\text{LiBa}_2\text{B}_3\text{O}_7$ (II), $\text{Ba}_2[\text{B}_4\text{O}_{10}\text{OH}_2](\text{OH})_2$ (III), $\text{Na}_2\text{Ba}_2[\text{B}_9\text{O}_{17}\text{OH}_2]$ (IV), $\text{LiBa}_2[\text{B}_9\text{O}_{17}\text{OH}_2]$ (V), $\text{Ba}_2[\text{B}_9\text{O}_{17}\text{OH}_2](\text{OH})_2\text{H}_2\text{O}$ (VI), and $\text{Ba}_2[\text{B}_9\text{O}_{17}\text{OH}_2](\text{OH})_2\text{H}_2\text{O}$ (VII) were recently synthesized and studied by XRD. The topology of the borate frameworks and sheets in I-VII may be described by means of the fundamental building block (FBB) consisting of BO$_3$ triangles and BO$_4$ tetrahedra. FBB in I (3BO$_4$ tetrahedra and 2BO$_3$ triangles) is the same as compared with that revealed in hilgardite. In contrast to I 3-membered polyhedral rings composed of 2BO$_3$ triangles and 1BO$_4$ tetrahedron can be considered as FBB within the framework of II. In contrast to I 3-membered polyhedral rings composed of 2BO$_3$ triangles and by 2 triangles. Two pseudo-hexagonal sheets in IV form the double layers, which are connected by Ba- and Na-polyhedra. V is characterized by new borate sheet, which is formed by 5 unique BO$_4$ tetrahedra and by 5BO$_3$ triangles. Two pentaborate groups are included in its FBB. One of them comprises 3 borate triangles and 2 borate tetrahedra, whereas the second one is formed by 3 borate tetrahedra and by 2 borate triangles. Similar FBB were recognized in double borate sheets of VI. However in contrast to V, in VI two adjacent layers are related by 2-fold axes to form a double borate sheet. The topology of the borate sheet of VII is practically the same as compared with that revealed in beringuccite, $\text{Na}_2[\text{B}_5\text{O}_{8}(\text{OH})_2]\text{H}_2\text{O}$, where FBB is formed by 3BO$_4$ triangles and by 2BO$_3$ tetrahedra. The interlayers in Ba-beringuicite and Na-beringuicite contain the Ba atoms and water molecules. Similarly with most of natural borates all studied structures contain three-membered borate rings formed either by 2 tetrahedra and 1 triangle or by 2 triangles and 1 tetrahedron.

Keywords: CRYSTAL STRUCTURE, XRD, BORATES

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I will discuss recent developments in microdiffraction experiments on soft materials at the ESRF. Instrumentation and experimental applications have been strongly influenced by applications in protein crystallography. Two main experimental lines can be distinguished: (i) single crystal diffractometry, (ii) scanning diffractometry including scanning small-angle scattering. Progress in microbeam protein crystallography has been linked to the development of a dedicated goniometer allowing rapidly positioning small samples in a microbeam. This concept has been extended to small molecule experiments. Scanning diffractometry has been used for mapping extended samples, such as fibers, using the same detection system as for single crystal diffractometry. Examples for both types of experiments will be discussed. A projection into the future suggests a convergence of both approaches into a single endstation.

Keywords: MICRODIFFRACTION SYNCHROTRON RADIATION SOFT CONDENSED MATTER