Phosphors produce light due to the presence of dopant ions – so called rare earth ions or transition metal ions. The crystallite material in which the dopant are located is called the host matrix. Host matrix plays a great role in performance of light emitting materials. It has to be translucent, so it does not absorb the visible light. It has to ensure the homogenous dispersion of dopant ions, so they do not interact with each other and quench their luminescence. It has to be stiff, so the lattice phonons do not allow the transition between dopant energy states without emission of the photon.

Borate host materials can be divided into two groups: simple (orthoborates, pyroborates) and condensed. In simple borates the borate groups BO_3 and BO_4 do not share oxygen atoms and are therefore separate from one another – the stiffness of the host rely then on the bonding between host cation and oxygen. In condensed borates borate groups share oxygen atoms creating variety of structures – chains, rings, networks. Their stiffness rely on B – O bonds.

Two borate phosphors: BMBO and LMBO will be modified by substitution of smaller ion for host cation. This substitution should not destroy the crystal structure, but rather slightly change it and thus lower the symmetry of the optically active ions' surrounding and increase the intensity of their luminescence. To trace these changes more accurately, this host will be also doped with Cr^{3+}, Eu^{3+} and Eu^{2+} ions, which serve as "optical probe" – their luminescent properties change substantially with changes in crystal structure.