Solid state LASERs mostly rely on single crystalline transparent bodies as the active LASER medium, which is pumped by flash lamps. Recently, some LASER types take advantage of the application of ceramic discs or bodies, since transparent ceramics broaden the range of applicable material compositions. Solid state LASERs using (Al,In,Ga)N or (Al,In,Ga)P semiconductors as active media are well-established for the blue and red spectral range. Green emitting semiconductor LASERs with high power are not feasible yet. A potential way to achieve green emitting solid state LASERs is the application of blue LASER diodes, which pump a green emitting (520 - 540 nm) LASER crystal or ceramic.

Samples as prepared in this work were made by the ceramic method in a reducing atmosphere, i.e. under CO, at about 1350 °C. To explore the green spectral range due to 4f-4f transitions of the respective trivalent rare earth ion, BLF were doped by 0.5 to 1.0% of Pr³⁺, Ho³⁺, or Er³⁺. Emission spectra reveal that all samples show efficient luminescence in the green spectral range.

Conclusion: BLF was doped by 0.5 to 1.0% of Pr³⁺, Ho³⁺, or Er³⁺ and shows for each ion emission in the green spectral range. The most intense emission peak for Ba₂LaF₇:Pr³⁺ appears at 481 nm, for Ba₂LaF₇:Er³⁺ at 538 nm and for Ba₂LaF₇:Ho³⁺ at 544 nm. However, solely Ba₂LaF₇:Pr³⁺ can be excited at 440 nm, which is the required wavelength as given by the diode LASER.