

# Luminescence properties of rare-earth doped borate glasses

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This work aims to investigate the characteristics related to the luminescence spectra of borate glasses  $\text{CaO-Al}_2\text{O}_3\text{-H}_3\text{BO}_3$  and  $\text{CaO-Al}_2\text{O}_3\text{-H}_3\text{BO}_3$  doped respectively with 1.0 wt% of  $\text{Yb}^{3+}$  and  $\text{Ce}^{3+}$ . These glasses were produced by melt and rapid cooling method. The compounds are from Sigma Aldrich with a 99.99% degree of purity. The spectral characteristics of  $\text{Yb}^{3+}$  and  $\text{Ce}^{3+}$  ions in borates and phosphates are important to optical applications. Such glasses can be useful as optical fibers doped and in solid-state lasers. The emission and excitation spectra were obtained using a spectrofluorometer (Nanolog-Horiba) with a photomultiplier tube R928P equipped with a Xenon lamp (CW 450 W) as the excitation source, and a filter of 399 nm. Lifetime was also obtained with the NanoLog using the same lamp and the same detector. Fig.1 (a) e (b) shows emission of  $\text{Ce}^{3+}$  (excitation 335 nm) and  $\text{Yb}^{3+}$  (excitation 334 nm) ions of borates glasses.

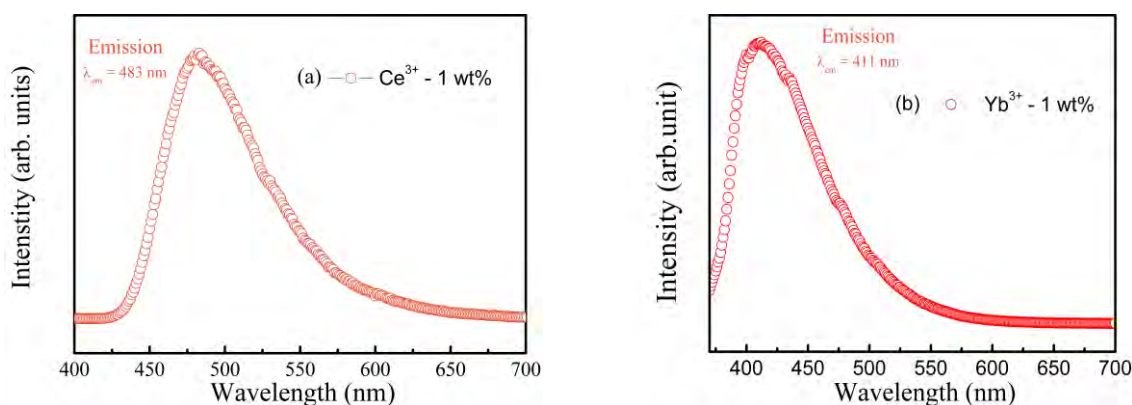


Fig.1. Luminescence spectra of the glass samples: (a)  $\text{CaO-Al}_2\text{O}_3\text{-H}_3\text{BO}_3\text{:Ce}_2\text{O}_3$ , and (b)  $\text{CaO-Al}_2\text{O}_3\text{-H}_3\text{BO}_3\text{:Yb}_2\text{O}_3$ .

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