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Orthoborate $LiSrY_2(BO_3)_3$ Host with Low Concentration Quenching

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$LiSrY_2(BO_3)_3$ is a recently explored host for observing lanthanide luminescence. This compound synthesized and activated with Tb^{3+}/Gd^{3+} is described. Trivalent activators Tb^{3+} and Gd^{3+} occupy yttrium sites. Intense characteristic emission is observed for both these activators. In case of Gd^{3+}, both excitation and emission lines arise in f−f transitions. Photo luminescence emission is obtained in UV region. In case of Tb^{3+}, mild concentration quenching was observed above 10%. Prominent excitation of Tb^{3+} is in form of a band arising in f−d type transition while emission comes from f−f transitions. Emission lifetimes are of the order of milliseconds, typical of forbidden f−f transitions.

Keywords: photoluminescence; borate; Gd^{3+}; Tb^{3+}.