

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

EPR Study of Lithium Borovanadate and Lithium Silicate Glasses

BIKESH DAHAL, D. BLANE BAKER, William Jewell College, STEVE FELLER, Coe College — Lithium borovanadate and lithium silicate samples with varying molar ratios were prepared using both roller quenching and plate quenching methods. Electron paramagnetic resonance EPR spectra of those samples show that resolution of the hyperfine structure lines(hfs) depend on their molar ratio. When the molar ratio (K) is less than 0.5 in the borovanadate system, the hyperfine structure lines are well resolved and defined. However, when the molar ratio becomes greater than 0.5; the spectra starts to get less resolved; at molar ratio 0.7 there is no hyperfine resolution. Well resolved samples were modeled by using a modeling program in MATLAB to obtain Hamiltonian parameters. The Hamiltonian parameters that were obtained were $g_{parallel}$, $g_{perpendicular}$, $A_{parallel}$ and $A_{perpendicular}$. The Hamiltonian parameters were calculated to learn about the orientation of V^{4+} ions and electrons in the glass samples. According to our calculation $g_{parallel} < g_{perpendicular} < g_e$ which suggests that crystal field of the V^{4+} ions has a octahedral site with a tetragonal compression in the glass samples.

Blane Baker

Date submitted: 29 Dec 2010

Electronic form version 1.4