

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Locations of metal ions in the new glasses in the alumina-calcia-monazite (LaPO_4) system¹ ROBERT MARZKE, GEORGE WOLF, SUSAN BOUCHER, JEREMY PIWOWARCZYK, WILLIAM PETUSKEY, Arizona State University — The new group of glasses synthesized from calcium aluminate (CaAl_2O_4) or C12A7 (CaO)₁₂(Al_2O_3)₇ with varying fractions of La-monazite (LaPO_4) has been characterized by electron microscopy, ^{31}P and ^{27}Al NMR, Raman scattering and chemical methods. These techniques have yielded information concerning the environments of the metal ions Al and La in the glasses. A substantial negative shift of the principal ^{31}P NMR line at all monazite fractions, along with Raman spectra showing that PO_4 groups do not share bridging oxygens, places La within the second coordination shell surrounding P. P-Al TRAPDOR double NMR experiments show that aluminum and phosphorus are also closely coordinated, accounting for a second, more negatively shifted line in the ^{31}P single resonance spectra. Models for the structures of these glasses have been constructed for a range of monazite contents, and will be presented.

¹Supported by NSF DMR01 16361, AFOSR F4062-03-1-0346 and AFOSR FA955004101153

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Date submitted: 18 Nov 2006

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