

Abstract Submitted
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New glasses in the alumina-calcia-monazite (LaPO_4) system: structural evidence from NMR, Raman scattering and thermal properties¹ ROBERT MARZKE, Physics and Astronomy, Arizona State University, Tempe, AZ 85287-1504, SUSAN BOUCHER, Chemistry and Biochemistry, Arizona State University, Tempe, AZ 85287-1604, JEREMY PIWOWARCZYK, Physics and Astronomy, Arizona State University, Tempe, AZ 85287-1504, GEORGE WOLF, Chemistry and Biochemistry, Arizona State University, Tempe, AZ 85287-1604 — A new group of glasses has been synthesized from the well-known compounds CaAl_2O_4 and $(\text{CaO})_{12}(\text{Al}_2\text{O}_3)_7$, melted together with monazite (LaPO_4) in compositions containing 2 to >75% of the latter. Raman and ^{31}P NMR spectra in the solid state show that PO_4 groups do not share bridging oxygens, i.e. that the materials are orthophosphates. Thermal properties and ^{27}Al NMR in both liquid and solid states indicate the presence of a strong aluminate network, based upon AlO_4 tetrahedra sharing corners. P/Al TRAPDOR NMR measurements show that P and Al are in close proximity in the glasses, most likely sharing P-O-Al linkages. However, clear and unambiguous signatures of the aluminate network are still sought. Models for the structures of these glasses, drawn from experiment, will be presented.

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