

Abstract Submitted  
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**A High Energy X-Ray Diffraction Study of the Atomic-Scale Structure of Novel Vitreous Rare Earth Phosphates**<sup>1</sup> ERANDI S. GUNAPALA, G.K. MARASINGHE, Department of Physics and Astrophysics, University of North Dakota, Grand Forks, ND 58202, CHRIS J. BENMORE, Advance Photon Source, Argonne National Laboratory, Argonne, IL 60439 — The magneto-optical properties of rare earth phosphate glasses make them good candidates for numerous potential applications including high-energy/high power ( $\sim 10^{15}$  watt) lasers. Because, properties of these materials depend heavily on their atomic structure, a detailed study can facilitate development of additional applications. A series of  $(\text{Pr}_2\text{O}_3)_x(\text{P}_2\text{O}_5)_{1-x}$  glasses where  $0.05 \leq x \leq 0.25$  had been characterized by high energy X-ray diffraction. Coordination parameters for nearest coordination neighbors were obtained by Gaussian fitting. The P-O coordination number,  $N_{PO}$ , and the P-O, O-O, P-P distances were found to be insensitive to the  $\text{Pr}_2\text{O}_3$  content. Coordination numbers  $N_{PrO}$  decreased from  $\sim 8.0$  to  $\sim 7.5$  with increasing  $\text{Pr}_2\text{O}_3$  content from 0.12 to 0.23. Pr-O distance did not seem to vary with  $\text{Pr}_2\text{O}_3$  content in the  $x$  range that we studied.

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