

Abstract Submitted  
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**Extended X-ray Absorption Fine Structure (EXAFS) Analysis of Vitreous Rare Earth Sodium Phosphates** CHANGHYEON YOO, KANISHKA MARASINGHE, Department of Physics and Astrophysics, University of North Dakota, Grand Forks, ND 58202, CARLO SEGRE, TOMOHIRO SHIBATA, Department of Physics & Center for Synchrotron Radiation Research and Instrumentation, Illinois Institute of Technology, Chicago, IL 60616 — The local structure around rare-earth ions ( $\text{RE}^{3+}$ ) in rare-earth ultraphosphate (REUP) glasses has been studied using RE  $L_{III}$  edge (RE = Nd, Er, Dy, and Eu) and K edge (RE = Nd, Pr, Dy, and Eu) extended X-ray absorption fine structure (EXAFS) spectroscopy.  $(\text{RE}_2\text{O}_3)_x(\text{Na}_2\text{O})_y(\text{P}_2\text{O}_5)_{1-x-y}$  glasses in the compositional range  $0 \leq x \leq 0.14$  and  $x + y = 0.3$  and  $0.4$  were studied. RE-oxygen (RE-O) coordination number decreases from  $\sim 10$  to  $\sim 7.5$  with increasing RE-content for Nd, Pr, Eu, and Dy. For Er, RE-O coordination number increases from  $\sim 8.7$  to  $\sim 10$  with increasing RE-content. For the first oxygen shell, the RE-O distance ranges between 2.41-2.43 Å, 2.44-2.46 Å, 2.24-2.26 Å, 2.28-2.32 Å, and 2.32-2.36 Å for Nd, Pr, Er, Dy, and EU glasses, respectively. Second shell around RE ions consists of phosphorus atoms, with RE-P distance about 3.0-3.5 Å and coordination number ranging from 1 to 3. The third shell primarily contains oxygen and is at a distance about 4.0-4.1 Å from RE ions.

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