

A moganite-type phase in the silica analog phosphorus oxynitride

**CHRISTIAN CHATEAU,¹ JULIAN HAINES,¹ JEAN-MICHEL LÉGER,^{1,*} ANDRÉ LESAUZE,²
AND ROGER MARCHAND ²**

¹Laboratoire de Physico-Chimie des Matériaux, Centre National de la Recherche Scientifique, 1 place Aristide Briand, 92195 Meudon cédex, France

²Laboratoire des Verres et Céramiques, UMR CNRS 6512, Université de Rennes 1, Campus de Beaulieu, Bat. 10, Avenue du Général Leclerc, 35042
Rennes cédex, France

ABSTRACT

A new polymorph of phosphorus oxynitride (PON) a silica analog has been recovered at ambient pressure by quenching after a treatment at 850 °C under a pressure of 2.5 GPa using cristobalite- or quartz-type phases as starting materials. This PON polymorph is a thermodynamically stable phase with its own stability field in a *P-T* diagram. The structure of this PON phase was refined by the Rietveld method from an X-ray powder diffractogram. It is isostructural with “moganite” (SiO₂). The discovery of this PON polymorph should stimulate a renewed interest in the occurrence of this phase in the silica system, because “moganite” may have a small but defined *P-T* stability field. These results confirm the structure of “moganite” as a new structure-type in AX₂ compounds.