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Cmcm **post-perovskite: a new alumina polymorph**[1] JUN TSUCHIYA, TAKU TSUCHIYA, RENATA WENTZCOVITCH, University of Minnesota — Alumina, Al_2O_3, is a model ceramic material with important applications in high pressure science, particularly as the ruby pressure scale. It is isoelectronic with $MgSiO_3$, the major Earth forming mineral. Here we show by first principles that the newly found post-perovskite polymorph of $MgSiO_3$, $CaIrO_3$ type structure with *Cmcm* symmetry, is also a stable high pressure phase of Al_2O_3 and should be stabilized in the pressure range in which the ruby scale has been calibrated. The sequence of polymorphs under pressure in these minerals is therefore analog: corundum/ilmenite $\rightarrow$ *Pbnm*-perovskite for MgSiO3 and Rh_2O_3(II) type for Al_2O_3 $\rightarrow$ *Cmcm* post-perovskite. The reason for the greater stability of *Pbnm*-perovskite in $MgSiO_3$ versus Rh_2O_3(II)-type in Al_2O_3 is the difference in cation polyhedral types and volumes in the former, that favors for ABX_3-type composition.

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