## Core-mantle interaction evidence from SiO<sub>2</sub> dispersal in Earth's lower mantle

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As the Earth accreted and progressively grew its core, Si and O probably dissolved into the metal and were kept there for some time. As the core subsequently cooled,  $SiO_2$  would have been expelled due to oversaturation, a process that could continue today. On account of  $SiO_2$ 's low density with respect to the lowermost mantle, we examine the process of  $SiO_2$  accumulation at the core-mantle boundary (CMB) and its incorporation into the mantle by buoyant rise. Diapirs formed by the viscous Rayleigh-Taylor instability in the  $SiO_2$  collected at the CMB would cause them to be swept into the mantle as inclusions of 100 m - 10 km diameter today, using estimates of  $SiO_2$  viscosity in the lower mantle. Under early Earth conditions of rapid heat loss after core formation, smaller, ~1 km diameter diapirs could have risen independently of mantle flow to a level of neutral buoyancy in the lower mantle, trapping them there.  $SiO_2$  presence could account for small-scale scattering in the lower mantle due to the bodies' large velocity contrast with peridotite.

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