

Melting experiments of MORB at high-pressure

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Subduction of basaltic crust gives rise to a strong chemical heterogeneity in the mantle, possibly extending down to the core-mantle boundary. Recent seismological studies indicate the presence of Ultra-Low Velocity Zone (ULVZ) above the core-mantle boundary (CMB). There is a possibility that Mid Ocean Ridge Basalt (MORB) melt exists and causes the seismic anomalies. However, there is few melting experiment of MORB under high pressure and high temperature conditions. Therefore, I carried out melting experiments using a laser heated diamond anvil cell in a pressure range between 35.3 and 51.5 GPa. The melting temperatures are 2760 K, 2780 K and 2920 K at 35.3 GPa, 46.1 GPa and 51.5 GPa, respectively. Extrapolation to 135 GPa yields a melting temperature of MORB of about 3700 K at CMB by using the melting relationship of Simon. My melting date suggest that the basaltic crust would be partially molten at the base of the lower mantle if temperature exceeds 3700 K.