

Distribution and transportation of melt in subduction zones

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Volcanic and seismic activities in subduction zones are the result of complex interaction of geophysical and geochemical processes. I have investigated the hydration and dehydration and the generation and transportation of melt in subducting slab and adjacent mantle wedge using a numerical model. The model includes hydration and dehydration of the slab and mantle wedge, melting and solidification of mantle peridotites, permeable flow of melt and aqueous fluids, and solid flow of mantle peridotites with water- and melt-induced weakening. The model shows the melt distribution in the mantle wedge beneath the volcanic front and extending sub-parallel with the subducting slab. The detailed geometry of the melt distribution is strongly dependent on the parameters including water solubility of peridotites and permeable flow velocities of melt and aqueous fluids. I will discuss the effect of these parameters on the melt distribution and the interdependence among the geodynamic processes in the subduction system.

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