



Counter-current convection in volcanic conduits

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The maintenance of continuing eruptive capability of Strombolian volcanoes is often thought to be due to a counter-current convection in the volcanic conduit, whereby buoyant outgassing upwelling magma rises, while a downgoing gas-poor viscous magma descends. An examination of this concept using theories of two-phase flow suggests that such a regime is only possible if the magma chamber pressure is extremely low, which in turn raises questions of whether such conditions are possible in a magma chamber. We consider certain elaborations which may have a bearing on this observation.