PETROGENESIS OF CALC-ALKALINE VOLCANIC ROCKS IN THE VISEGRÁD MTS. (NORTH HUNGARY)

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In the Visegrád Mts. the calc-alkaline volcanism started 16.5Ma and ended 13.5Ma. Four rock types can be distinguished: 1) garnet-bearing dacite, 2) garnet-free enstatite dacite, 3) andesite, and 4) undercooled basaltic andesite inclusions. The most primitive rocks are the undercooled inclusions. They have high volatile content, indicated by abundant amphibole and small bubbles in the groundmass, and low MgO and high Al2O3 content. These mafic inclusions formed from a mafic melt under relatively low-temperature and chilled in a cooler and more acidic magma. Based on geochemical data, the two dacite series are cogenetic and could have formed by process of fractional crystallisation near the boundary between crust and mantle. The presence of strongly banded and fan-like structures in the dacites might have been produced by laminar magma flow and mixing which could have occurred in the conduit towards to the surface. We propose that the melt of the most primitive undercooled basaltic andesite could have generated by partial melting of subducted slab.. It is thought that the hot and volatile-rich ascending mafic melts might have caused partial melting of lower crust which produced acidic (dacitic?) melt. Lowering the buoyancy of dacitic melt by volatile and heat involving from the underlying mafic magma caused rapid uplift of dacites and decompression in the magma chamber. As a consequence of this decompression, the mafic magma ascended and refilled the magma chamber. This process formed the basically uniform andesitic melt. In the final stage of magma evolution andesitic dikes crosscut andesitic country rocks. The composition of these dikes and the host rocks are basically the same. Eruption of the host andesitic rock must have taken place under compressional environment, whereas andesitic dikes represent undoubtedly tensional regime.