

NATURE OF ECLOGITES OF THE MAXYUTOV COMPLEX (SOUTHERN URALS)

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The Maxyutov Complex is located within the western part of the Southern Urals and consists of eclogite, glaucophane and quartz-micaceous schist, quartzite, and serpentinite. Eclogites are met as separate blocks and boudins in blueschists and contain pyrope-grossular-almandine garnet, omphacite, and rutile. Garnet and clinopyroxene are replaced by an aggregate of glaucophane, epidote, phengite, quartz, and albite. Garnet is high ferruginous - $\text{Fe}/(\text{Fe}+\text{Mg})=50-75\%$ and zoned with Mg increase and Fe and Ca decrease to the edge of its grains. They contain numerous inclusions; Mg number of pyroxene inclusions increases to the edge of zoned garnet grains. In our opinion, the simultaneous increase of Mg number of garnet and omphacite reflects the crystallization of eclogite magma under the high fluid pressure during its intrusion. This is proved by the decrease of jadeite component in clinopyroxene (as an indicator of depth) to the edge of large omphacite grains. Rutile of eclogite (rarely more than 5 vol.%) contain numerous oriented ilmenite intergrowths typical for ilmenite-rutile eclogites in kimberlitic pipes formed at a temperature of not less than 1050°C. Eclogite underwent metamorphism in the facies of epidote-glaucophane schists according to the reaction: $1,64\text{garnet} + 2,95\text{omphacite} + 1,47\text{SiO}_2 + 1,29\text{H}_2\text{O} + 0,45\text{Na}_2\text{O} = \text{albite} + 0,79\text{glaucophane} + \text{epidote} + 0,72\text{Fe}_2\text{O}_3$. Eclogites metamorphosed to various degrees contain cubic graphite pseudomorphs after diamond. These finds prove polyfacial nature of eclogites: their crystallization began in the field of the diamond stability ($P^340\text{ kb}$, $T=1100^\circ\text{C}$) and proceeded on the higher levels of mantle and in the Earth's crust.