PRELIMINARY ESTIMATION OF TAGAMITE COOLING CONDITIONS (PUCHEZH-KATUNKI ASTROBLEME, RUSSIA).

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The velosities and initial temperatures of crystallization from super-heated shocked melts have been estimated as a result of the investigation of the structures and mineral association in impact melt rocks of Puchezh-Katunki astrobleme. The dependence of the these parameters vs. the body thickness of impact melt rocks have been found.

Impact melt rocks of Puchezh-Katunki astrobleme are represented by thin dikes and veins in gneisses and amphibolites. The thickness of such formations ranges from few sm to few m (more seldom few tens of meters). Sometimes these impact melt rocks include shocked rock and mineral fragments of the target (from few % to few tens of %). Their texture ranges from glassy to fine crystalline. In crystalline impact melt rocks there are Pl-lathes, Cpx and Opx grains (small, often skeletal).

Pl is of needle and long-prism form (length to some tens of mkm, width to ten mkm). Pl is often zonate. Its composition changes from $An_{52.5}Ab_{45.5}Or_2$ in the nucleus to pure Ab in the range. The zonation sometimes is reverse. Thus in the sample B-3035 Pl composition changes from $An_{21.0}Ab_{77.0}Or_2$ in the nucleus to $An_{38.9}Ab_{57.9}Or_{3.2}$ in the range. Such phenomenon may be caused by either Pl nuclei albitization or by Pl crystallization around tiny nonmelted relicts of the target rock Pl. Cpx and Opx are of long-prizm face- ore edge-skeletal forms and zonate as a rule. The crystal length reaches 30 mkm, the width - few mkm. The succession of Cpx and Opx crystallization may be different even in a single thin section. Sometimes Cpx forms fine grains and Opx grows around it in needles. Sometimes a reverse picture is observed. Such phenomenon shows non-equilibrium of impact melt crustallization as a whole. Sometimes Cpx and Opx grows closely into each other which shows simultaneity of their crystallization. Cpx composition ranges: in nuclei - $En_{55-39}Fs_{22-14}Woll_{47-23}$; in

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ranges - $En_{49-33}Fs_{30-14}Woll_{44-27}$. Opx composition ranges from Fs_{27} in the nucleus to Fs_{41} in the range. Impact melt rock cooling velosities were estimated by Lofgran diagram [1] (by Ti and Al content in Cpx). Initial crystallization temperatures of impact melts were defined with two-pyroxen thermometer [2]. The preliminary estimations of impact melt rock cooling conditions of Puchezh-Katunki astrobleme allowed us to state: 1. the cooling velosity of impact melts from thin dices (~1 m thin) and from edge parts of thicker dices is $\geq 10^{\circ}C$/hour (group I); 2. cooling velosity of impact melts from the central parts of the relatively thick dikes (~ 5 m thickness and more) is ~ $4^{\circ}C$/hour (group II). The initial crystallization temperatures of impact melts of group I are ~ 1350-1400$^{\circ}C$, group II - 1100-1200$^{\circ}C$. Thus we may assume non-equilibrium impact melt crystallization of Puchezh-Katunki astrobleme melts. The comparison of impact melt rocks of Puchezh-Katunki, Zhamanshin and Boltysh astroblems allows us to make a row in which there is a connection between the body thickness and the impact melt cooling conditions. The initial impact melt crystallization temperature of thick Boltysh body (~ 200 m thickness) was estimated by us as ~ 800$^{\circ}C$ [3], and the first liquidus phase (spinel) in Zhamanshin thin jet fragments, bombs, lapilli, splashes (thickness in first tens of sm) appears at 1800$^{\circ}C$ [4].

[1] Physics of magmaqtic processes. Princton.(1980); [2] L.Perchuk and J.Rjabchikov (1976). Compositional relations in mineral systems. (in Russian); [3] L.Sazonova, V.Feldman, N.Korotaeva (1989). LPSC XX; [4] V.Feldman (1990). Petrology of impactites (in Russian).