CO-GENETIC FLUID+MELT JETS IN THE POPIGAI LECHATELIERITES: A MULTI-STAGE ORIGIN.

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Introduction: Water plays an important role at all stages of the impact cratering, what can be shown on the Popigai examples: impact anatexis of target gneisses [1], origin of suevite +tagamite mega-mixtures [2] impact fluidizites [3], high-pressure H_2O inclusions [4], etc. The lechatelierites (Ls) with several fluid +melt injections from outside are the further example of so kind. Below, the petrography and the microprobe data on the Ls are presented; ion probe studies of their volatiles are in progress.

The glass petrography: Ls are collected from the Daldyn type suevites [5] as splash-form particles and fragments 3 to 5 cm in size; sometimes, they contain blocks of the diaplectic quartz glass, DQGs. Both the Ls and DQGs are fresh and clear. Flowing bands of melt+fluid jets penetrate the L-particles from outside. Some jets (type I and II glasses) are colorless or pale-yellowish, show the traces of partial homogenization with the host L, and are highly-saturated with fluid inclusions. Other jets (type III glasses) are brown-yellowish low-porous bands clearly separated from the host L but show turbulent and swirled traces of dynamic interaction on the contact without mixing. Type I and II glasses contain cogenetic gas, gas+liquid and entirely liquid at 20^oC low-salt H_2O inclusions [4]; type III glasses have gas bubbles only.

Geochemistry of the glasses: All data are of average, in wt. %. Ls+DQGs contain poor impurities (12 analyses): SiO_2 98.91; other main petrogenic oxides, MPOs, 0.19; a loss of analyses, LA, 0.90. Type I glasses are high-silica, with a clear K-Na specificity (8 analyses): SiO_2 96.88; other MPOs 1.47, including Na_2O+K_2O 0.53; Al_2O_3 0.33; LA 1.65. Type II glasses are also high-silica (14 analyses, SiO_2 93.99), but show increase in MPOs (3.67), including Na_2O 0.35; K_2O 0.71; Al_2O_3 1.49; FeO 0.42; MgO 0.31; CaO 0.25; TiO_2 0.11; LA 2.34. Type III glasses are equal to usual Popigai tagamites in terms of bulk geochemistry (10 analyses): SiO_2 63.58; Al_2O_3 15.72; Na_2O 1.75; K_2O 2.56; FeO 6.84; MgO 3.71; CaO 2.92; TiO_2 0.56; MnO 0.09; LA 2.27.

Discussion and conclusion: Type I and II glasses are the earlier hot and mobile volatile-rich jets, having a lot of H_2O inclusions and increased LA comparing to the same of the lost L (1.65 and 2.34 vs. 0.90, correspondingly). Type I glasses are the result of unlimited mixing between silica and the products derived from K-Na feldspars; a less of Al_2O_3 (K_2O+Na_2O/Al_2O_3 ~1.6) can suppose the earlier impact anatexis in their origin, with mobilization of SiO_2, K_2O, Na_2O and H_2O vs. Al_2O_3 and other MPOs, like it is known in the Popigai [1]. Type II glasses are the result of unlimited mixing between silica and mixed melts derived from the "wet" target gneisses. Type III glasses are the result of dynamic interaction between silica and mixed glasses derived from usual target gneisses. So, the Ls have complex multi-stage origin and various sources for type I, II and III glasses quenched in suevites.

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