C-O-H fluid inclusions in garnet from kimberlite pipe “Mir”

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The behavior of deep-seated fluids is one of the most intriguing issues of the Earth's and planetary dynamic processes, since they influence most of the geologic processes in the deep mantle, such as mantle metasomatism, magma generation, and diamond formation [1,2]. Here we studied the primary fluid inclusions in low-Cr peridotitic garnet from Mir kimberlite pipe. These inclusions were analyzed by Raman and IR spectroscopy. The IR spectra revealed complex polyphase composition. For fluid inclusions we observed three hydrocarbon peaks near 2857, 2927 and 2955 cm^{-1}, a broad water absorption band within the range of 3100–3600 cm^{-1} and sharp (OH^-) peak at around 3700 cm^{-1}. Raman spectroscopy revealed a strong luminescence and interference patterns and will be studied further with different wavelength. Polyphase fluid inclusions indicates a complex composition of the deep-seated fluid; discovery of hydrocarbon inclusions suggests the reduced conditions for studied kimberlitic garnets formation.

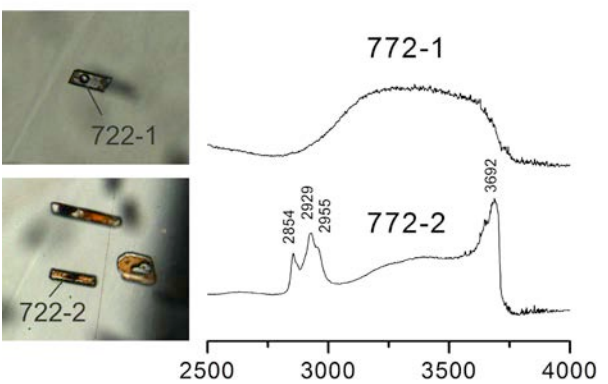

Figure 1. Example of the IR spectra of polyphase fluid inclusions in the garnet from the Mir kimberlite pipe.

[1] Litasov (2011) *Russian Geology and Geophysics* **52**, 475-492. [2] Shirey *et al*. (2013) *Reviews in Mineralogy and Geochemistry* **75**, 355-421.

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