Fluid inclusion in quartz from the Aligudarz Granitoids, NW Iran

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The Aligudarz granitoid plutons intruded into meta-sediments in the Sananday-Sirjan zone, NW of Aligudarz city (west Iran). Based on petrography and geochemistry, the Aligudarz granitoid has been classified as granite, granodiorite and S-Type pegmatite with the mineral assemblage of quartz, plagioclase, K-feldspar, biotite and muscovite. The intrusion has thermally metamorphosed the country rocks up to the albite-epidote-hornfels facies. Fluid inclusions studies in the quartz veins of the Aligudarz granitoid show four types of fluid inclusions (Fig.1): 1) low saline aqueous inclusions; 2) high saline inclusions (Fig. 2); 3) CO_2-H_2O rich inclusions; and 4) carbonic inclusions. The density data obtained from the fluids indicate entrapment temperatures of 580 to 636 °C at pressures of 3.9 to 5.1 Mbars. These conditions nearly coincide with the obtained mineral P-T estimations. There are partial melting processes during the formation of the S-Type Aligudarz granitoids.

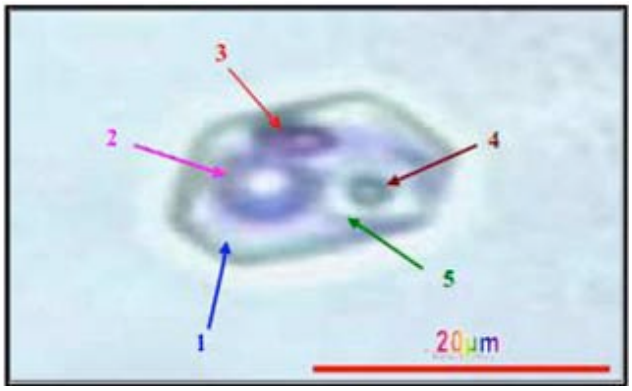

Fig. 2. Fluid inclusion in a quartz vein of the Aligudarz granitoid (high saline inclusion)

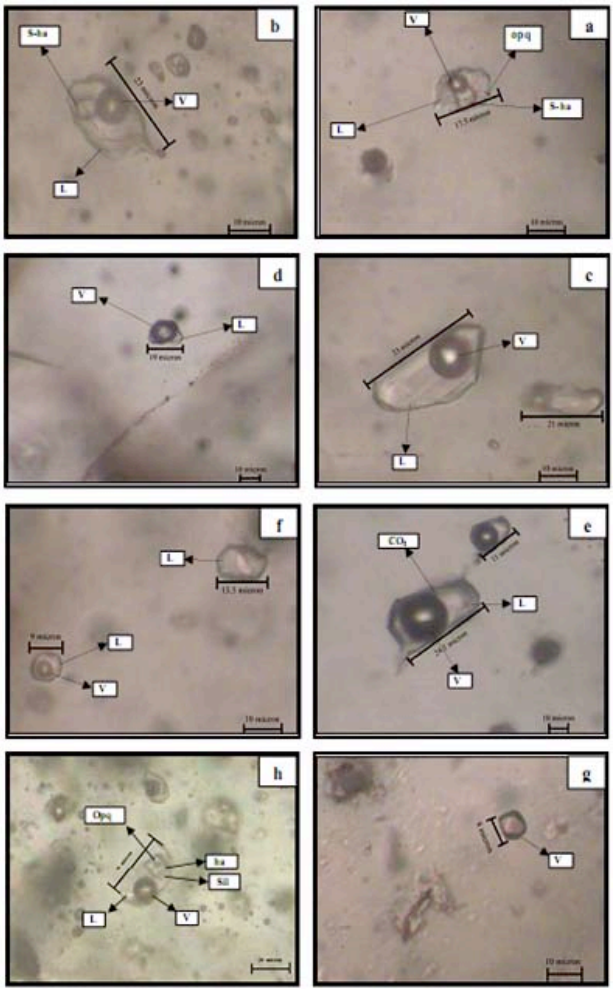

Fig. 1. a-b: three-phase fluid inclusions (L+V+S); c: two phase fluid inclusions (L+V), rich of liquid phase; d: two-phase fluid inclusions (L+V), rich of vapour phase; e: two-phase fluid inclusions (L+V) including two phases of non-mixed vapour; f: liquid single phase fluid inclusion (L) and two phase inclusion (L+V); g: single phase of fluid inclusion (V); H: multi-phase fluid inclusion (L+V+ha+sil+opg)