

Aqueous fluids with salinity similar to seawater in subduction channels: Fluid inclusions in jadeite-rich rocks from serpentinite mélangé, Rio San Juan Complex, Dominican Republic

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Partitioning behaviour of large-ion-lithophile elements (LILE) between aqueous fluids and silicate melts or crystals suggests that slab-derived fluids contain Cl, in order to explain LILE abundances in arc basalts [1] [2]. Seawater (3.5% NaCl equiv.)-like saline fluid inclusions (FI) were observed in peridotite xenoliths from the mantle wedge beneath the Pinatubo volcano (5.1 wt% NaCl equiv. [3]) and the Ichinomegata volcano (3.7 % NaCl, [4]). Saline FI are commonly found in high-pressure metamorphic rocks [5].

Here we report preliminary salinity data of rare aqueous FI in jadeite-rich rocks from serpentinite mélangés of the Rio San Juan Complex [6]. FI are about 5 micrometers or smaller and usually only found in clear crystal rims. The results using microthermometry of FI so far show that salinity data in FI from jadeite are similar to each other [4 samples: 4.6±0.4% (n=9), 4.2±0.45% (n=7), 4.2±0.5% (n=4), 4.5% (n=1) NaCl equiv.], regardless of whether or not the host rock is albite- or quartz-bearing, or whether jadeite formed by direct precipitation (P-type) from a fluid or metasomatic replacement of a protolith (R-type). In two quartz- and lawsonite-rich samples, FI in lawsonite revealed similar values of 4.4±0.14% (n=2) and 4.2% (n=1), but FI in grain boundaries of quartz aggregates show distinctly lower 2.7±1.3% (n=8) NaCl equiv.

The salinity of fluid inclusions in jadeitites was reported to be 0–7 wt% NaCl equiv. from Guatemala [7] and 5.1±1.9% NaCl equiv. in Myanmar [8]. We suggest that jadeite-rich rocks can conserve aqueous fluids with salinity similar to seawater, which are carried down in the slab and dewatered to the mantle wedge.

[1] Keppler, (1996), *Nature* [2] Kawamoto et al., (2014), *Earth Planet Space* [3] Kawamoto et al., (2013), *PNAS* [4] Kumagai et al., (2014), *Contrib Mineral Petrol* [5] Frezzotti and Ferrando, (2015), *Am Mineral* [6] Schertl, et al., (2012), *Eur J Mineral* [7] Sisson et al., (2006), *Geol Soc Am meeting* [8] Shi et al. (2006), *Geochem J*