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Corrigendum

Corrigendum to 'Isotopic evidence ($^{87}Sr/^{86}Sr$, δ^7Li) for alteration of the oceanic crust at deep-rooted mud volcanoes in the Gulf of Cadiz, NE Atlantic Ocean' [Geochim. Cosmochim. Acta 73 (2009) 5444–5459]

The authors regret:

We have been made aware of an error in the calculation of lithium (Li) isotope fractionation factors and temperatures for fluid–sediment and fluid–rock interactions (Table 5 in Scholz et al. (2009)). The corrected values calculated using Eqs. (1)–(4) in Scholz et al. (2009) are listed in Table 1.

Some of the corrected temperature estimates are substantially lower than the originally published values and therefore require an alternative interpretation. Pore fluids of all mud volcanoes studied by Scholz et al. (2009) show clear indications for clay dehydration processes at depth, such as negative chlorinity anomalies and inversely correlated oxygen and hydrogen isotopes (Dählmann and de Lange, 2003). Clay dehydration reactions generally take place at temperatures between ~60 °C and 150 °C (e.g., Kastner et al., 1991). The corrected temperature estimates for the mud volcanoes Captain Arutyunov, Carlos Ribeiro and Bonjardim fall below the lower temperature limit for clay dehydration. This observation suggests that the deep-sourced pore fluids at these locations are strongly affected by shallow alteration processes involving uptake of isotopically light Li by secondary minerals at low temperature. A more comprehensive discussion of Li isotope fractionation during fluid transport and other factors leading to variability in the Li concentration and isotope composition of mud volcano fluids in the Gulf of Cadiz is given in Scholz et al. (2010). Additional uncertainty in the calculation of temperatures for fluid–sediment and fluid–rock interactions is related to the unknown extent to which the original seawater Li has undergone exchange with ambient sediments and rocks as well as to past variability in the seawater Li concentration and isotope composition (e.g., Misra and Froelich, 2012).

The authors would like to apologise for any inconvenience caused.

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Table 1
Corrected Li isotope fractionation factors for fluid–sediment and fluid–rock interactions at five mud volcanoes in the Gulf of Cadiz.

Sampling location	Li_{PF} (µM)	δ^7Li_{PF} (‰)	f_{SW}	f_{INT}	δ^7Li_{INT}[a] (‰)	$\alpha_{SP\text{-}INT}$[b]	T (°C)
Mercator MV	2980	+12.3	0.01	0.99	+12.1	0.988	98
CAMV	463	+16.8	0.06	0.94	+16.0	0.984	41
CRMV	120	+19.9	0.22	0.78	+16.8	0.983	30
Bonjardim MV	177	+19.6	0.15	0.85	+17.6	0.983	21
Porto MV	99	+12.1	0.13	0.87	+9.3	0.991	159

[a] Calculated assuming $\delta^7Li_{SW} = 31$(‰).
[b] Calculated assuming $\delta^7Li_{SP} = 0$(‰).

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