Geochemistry and petrology of the Rockeskyller Kopf volcanic complex, West Eifel, Germany

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The Rockeskyller Kopf volcanic complex was active between 474(39) ka and 360(40) ka and comprises three distinct eruptive centres: SE Lammersdorf (SEL), Rockeskyller Kopf (RKK) and Franzosenbuche (FB). The earliest (SEL) eruptive episode was predominatly phreato-magmtic, producing a sequence of lithic-rich pyroclastic flows with minor juvenile-lapilli dominated units. The younger RKK centre onlaps the SEL deposits and is dominated by lithic-poor magmatic coarse-grained partially welded lapilli-tuff. The last eruptive centre (FB) comprises a scoria cone filled by airfall deposits and lava flows.

The lavas are essentially unfractionated basanites to picrobasalts and each centre is geochemically distinct, indicating a heterogeneous mantle source region. Modelling trace element data assuming non-modal melting reveal magma sources at depths corresponding to spinel-garnet peridotite with hydrous phases: biotite for SEL, amphibole for FB and both phases for RKK lavas.

All lavas contain variable amounts of olivine (X_{fo}~0.88-7), clinopyroxene ± spinel, ± biotite phenocrysts. Different types of cpx are revealed by different zoning patterns; some contain Na and Fe-rich green cores. Peridotite and clinopyroxenite xenoliths are restricted to the SEL deposits, but cpx and biotite megacrysts occur in both SEL and RKK deposits. Cpx megacrysts have mg# = 0.76-0.90 and Fe^{3+}/Fe_{tot} = 0.25-0.45. They are homogeneous, but sometimes have an overgrowth rim of variable thickness that is richer in Fe and Al. Application of the geobarometer of [1] to the cpx megacrysts reveals that they crystallised within the magmatic system at shallow crustal levels (< ca. 1.5 kb).

[1] Nimis & Ulmer (1998) *Contrib. Mineral. Petrol.* **133**, 122-135.

S isotope data from the undefined Cambrian Series 2 and Series 3 of Gondwana: Evidence for regional variations in the global sulphur cycle and/or proxies for a chemostratigraphic correlation?

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Our knowledge of the seawater sulphate sulphur isotopic composition and its variation during the Cambrian is rather limited. Whereas an extensive database exists for the Neoproterozoic–Terrenuevian (Lower Cambrian), the respective $\delta^{34}S$ signature for the undefined Cambrian Series 2 and Series 3 (traditional Lower–Middle Cambrian boundary interval) and the Furongian (Upper Cambrian) is poorly known. Recent efforts of the International Commission on Stratigraphy to subdivide the Cambrian System into four series require not only detailed information on biostratigraphy, but comprehensive chemostratigraphic data sets are necessary too.

We present the first $\delta^{34}S$ data from carbonate associated sulphates (CAS) from the undefined Cambrian Series 2 and Series 3 of Gondwana. The carbonate intervals of three sections (two Spanish and one French localities) were analysed: the Láncara Formation of the Cantabrian zone (NW Spain) and the Lastours-, Poussarou-, and La Tanque formations of the Montagne Noire (S France). $\delta^{34}S_{CAS}$ values vary between 19.9 and 33.2‰. Whereas at least one of the Spanish localities shows a slight increase in $\delta^{34}S_{CAS}$ towards the top, such a trend is not observable within the French section. It rather seems that the $\delta^{34}S$ values fluctuate around a mean of about 29‰ or even show a contrary trend upsection. Unusually positive $\delta^{34}S$ values of about 50‰, as reported from the upper Middle Cambrian of Australia [1], were not observed, even if this stratigraphic portion should be covered by the here presented data set.

Questions arising include, e.g.: (1) Does the $\delta^{34}S$ isotopic record really reflect trends in the global sulphur cycle? (2) Which influence have local phenomena? (3) What are the consequences for the palaeogeographic reconstruction of the investigated regions? (4) How should the potential of $\delta^{34}S_{CAS}$ for a chemostratigraphic correlation be evaluated?

[1] Hough *et al.* (2006) *Terra Nova* **18**, 257–263.