S in CAMP and Paranà-Etendeka CFBs

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Synchrony of continental flood basalts (CFB) and significant Phanerozoic mass extinction events may suggest a trigger effect of large scale basaltic eruptions on the global climate and environment, mainly due to intense emissions of volcanic gases such as SO_2 and CO_2 [1]. However, this interpretation is based on poorly constrained gas contents of the basalts and on even less well known gas emission rates. Here we investigate the S content of basalts of two of the largest CFB provinces: the Central Atlantic magmatic province (CAMP) and the Paranà-Etendeka (PE). Notably, while the CAMP is synchronous with and possibly triggered the end-Triassic extinction [2], PE basalts had a very minor effect on the early Cretaceous biosphere [3].

Melt inclusions in CAMP basalt olivines yield S contents (electron microprobe analyses) comparable to those found in Deccan basalts [1], whereas S in matrix glass is close to detection limit, suggesting that degassing during the eruption was almost complete.

As an alternative approach, we measure S (and Cl) contents (synchrotrone analyses) also in phenocrysts from CAMP and PE basalts and extrapolate the magmatic S content through newly established crystal/melt partition coefficients. These results illuminate the difference which seem to exist between the two CFB provinces and contribute to our understanding of their different environmental impacts.

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Mineral chemistry and fluid inclusion characteristics of the Kabadüz Ore Veins (Ordu, NE-Turkey)

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Hydrothermal vein type deposits of Kabadüz region (Ordu, NE-Turkey), are located in the Upper Cretaceous andesitic-basaltic rocks and formed in fault zones of the NW-SE directions. The primary mineral paragenesis of the ore veins are composed of pyrite, chalcopyrite, sphalerite, galena and tetrahedrite-tennantite with quartz and lesser amount calcite and barite as a gangue mineral. Petrographical studies suggest that ore veins in the region have similar mineral paragenesis, succession and textural properties.

Pyrite contains up to 0.95 wt% Zn, and 0.60 wt% As, chalcopyrite contains up to 0.86 wt% Zn and 0.14 wt% Au. Sphalerite is poor in Fe and contains up to 0.35 wt% Mn, 2.18 wt% Cu, and 0.89 wt% Cd. Tetrahedrite and tennantite are also poor in Fe content (up to 1.56 wt%). Different phases from the each different veins are found to be similar in composition. Lower Ni and Co content of the pyrites and Zn/Cd ratio of the sphalerites suggest that hydrothermal solutions related to the acidic type magmatic activity.

Homogenisation temperature (Th) and salinity data vary between 180-436.1 ºC and, 0.4-14.7 % NaCl, at the fluid inclusions of sphalerite and quartz. On the basis of first melting temperatures, $CaCl_2$, $MgCl_2$ and $FeCl_2$ were dominant at the higher Th, whereas NaCl and KCI at the lower Th conditions. Salinity content of the inclusions imply that hydrothermal solutions related to the magmatic sources. On the other hand well defined positive correlation between Th and salinity indicate that meteoric water involved in the hydrothermal solutions. In addition to petrographical studies, mineral chemistry analyses and fluid inclusion properties indicate that ore veins in the region have occured same or similar ore formation conditions.