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### Fe isotopic composition of sulphides from hydrothermal vents in North Atlantic

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Precipitated Fe sulphides that are spatially associated with hydrothermal vents on the ocean floor are believed to record the isotopic composition of Fe in hydrothermal fluids supplied to the ocean [1,2]. It has been recently demonstrated that the Fe isotopic composition of sulphide particles can be significantly modified by redox reactions between the fluids and the ocean water [3]. In this study we explore the possibility whether such shift in Fe isotopic composition could also be related to the phase composition of precipitated sulphides.

Laser ablation (New Wave UP213) provided the high-spatial resolution required for isotopic analysis of sub-millimeter sized sulphide grains. The mass resolution of ca 6500 achieved by MC ICPMS (Finnigan Neptune) was sufficient to resolve the Ar-, O- and N-based interferences on Fe isotopes. The measured isotopic ratios were corrected for mass discrimination from measurements of an in-house sulphide isotopic standard before and after each analysis.

The composition of Fe in iron sulphides collected from a high-temperature breccia (~ 250 °C) was isotopically heavier by ca 2 permil compared to the isotopic composition of iron sulphides that constitute the walls of the vents and that form at significantly lower temperatures (< 150 °C). In addition, the Fe isotopic composition of iron-zinc sulphide from the vent was similar to that of the iron sulphide from the high temperature breccia. This observation indicates that temperature may not be the major factor controlling the Fe isotopic composition of hydrothermal sulphides. Different redox mechanisms are also unlikely to produce the observed isotopic shift as the sulphides precipitated before they could interact with the sea water. Instead, it is possible that differences in the crystal chemistry, namely the somewhat different oxidation state of Fe in the two studied sulphides could produce the observed shift in Fe isotopic composition.

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### A study on copper isotope compositions of Dexing porphyry Cu-Au deposit of Jiangxi, China

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The Dexing porphyry Cu-Au deposit in Jiangxi Province, Eastern China, is famous for its great reserves of copper ores. The deposit was genetically related to Early Jurassic granodiorite porphyry. The wall rocks are Middle Proterozoic Shuangqiaoshan Group. There are potash-feldsparization, biotitization, sericitization, quartzification and chloritization within the internal parts of the porphyry body, quartzification, sericitization, chloritization and carbonation in the verges of porphyry body and sericitization, chloritization and quartzification in the wallrocks. The copper, gold and molybdenum mineralizations occurred in the contact zone between the porphyry body and wallrocks.

The copper resource about the deposit is still in debate. In order to further investigate the problem we have conducted a study of Cu isotope of chalcopyrites. 5 chalcopyrites from the altered granodiorite porphyry were analysed by MC-ICPMS in the Melbourne University of Australia. The  $\delta^{65}\text{Cu}$  values of two clusters of chalcopyrites and one veinlet type chalcopyrite from intensely altered granodiorite porphyry are 0.36‰, 0.05‰ and 0.06‰ respectively. The  $\delta^{65}\text{Cu}$  values of clusters of chalcopyrite and veinlet type chalcopyrite from weakly altered granodiorite porphyry are 0.13‰ and -0.6‰ respectively. The above copper isotope compositions of chalcopyrites are compatible with those of chalcopyrites from high-temperature magmatic hydrothermal deposits[1], and those from Dongguashan Cu-Au deposit in Tongling, Eastern China, in which the copper was considered to come from the copper-bearing magmatic fluids[2]. The characteristics of the copper isotope show that the copper in the Dexing deposit might have been derived from the magmatic rocks. The differences in the copper isotope compositions between the different samples may be related to the formation temperatures of samples. Large copper isotope fractionations may occur during Cu-sulfide precipitation from ore-forming solutions at low temperatures[1,3].

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