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## Magnesium Isotope Compositions of modern Sponges and Corals

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Mass-dependent variations in the Mg isotope compositions of modern biogenic marine carbonates are analyzed to investigate calcification mechanisms and the potential of Mg isotopes as proxies in paleooceanography. Following chemical purification by cation exchange, Mg isotope compositions were analyzed relative to the DSM3 Mg isotope standard (Galy et al., JAAS 2004) using an Axiom MC-ICP-MS. Repeated analyses of seawater and a coral reference sample (JCp-1; *Porites*) yielded  $\delta^{26}$ Mg values of -0.79 ±0.10 per mil (n = 25, 2 sd) and -1.90 ±0.11 per mil (n = 9, 2 sd), respectively.

The Mg isotope fractionation of -1.1 per mil ( $\delta^{26}$ Mg) between coral aragonite and seawater is consistent with the fractionation observed for Acropora and Pocillopora  $(\sim -0.9 \text{ per mil})$  (Chang et al., *Biochem. Biophys. Res. Comm.* 2004). In contrast to the coral data, first results for sclerosponges, Vaceletia (aragonite) and Acanthochaetetes (high Mg calcite), show much larger fractionations of  $-2.2 \pm 0.3$  per mil ( $\delta^{26}$ Mg) relative to seawater. Although calcification temperatures for the sponge samples differ by up to 10°C, no clear relationship between temperature and Mg isotope fractionation has been found. Sclerosponges show no vital effects for O, C and Ca isotopes (Böhm et al., GCA 2000; Gussone et al., this meeting). This may indicate that Mg isotopes are incorporated into sclerosponge skeletons without vital effects. There is no significant offset for the Mg isotope fractionation in sponge aragonite and calcite. The similar Mg isotope fractionation displayed by aragonitic and calcitic sponges suggests that the Mg isotope fractionation is only slightly affected by the different crystal structure and surface properties of the two carbonate polymorphs. A smaller isotope fractionation in coral aragonite is observed for both, Mg and Ca isotopes (Böhm et al., this meeting). The overall similarities of Ca and Mg isotope fractionation during carbonate precipitation are consistent with similar isotope fractionation mechanisms for both elements. Thus, Mg isotope fractionation in carbonates may be rate-controlled as proposed for Ca isotopes (Lemarchand et al., *GCA* 2004) and the smaller Mg isotope fractionation in the coral aragonite relative to the sponge aragonite may be attributed to higher precipitation rates.