



Geochemical characteristics and early diagenesis of recent carbonate mound sediments in the Gulf of Cadiz

Helen Hamaekers (1), Anneleen Foubert (1), Claudia Wienberg (2), Dierk Hebbeln (2), and Rudy Swennen (1)

(1) Department of Earth and Environmental Sciences, K.U. Leuven, Heverlee (Leuven), Belgium
(anneleen.foubert@ees.kuleuven.be), (2) MARUM – Center for Marine Environmental Sciences, University of Bremen,
Bremen, Germany

Cold-water coral carbonate mounds occur in patches along the continental margin of the North Atlantic Ocean, from northern Norway down to Mauretania. Recent research has been focused on carbonate mounds in the Gulf of Cadiz, especially along the Moroccan margin. The Pen Duick, the Renard and the Vernadsky carbonate mound provinces in the Gulf of Cádiz are only some of the mound provinces which have been the subject of several recent research projects (Foubert et al., 2008; Wienberg et al., 2009). No living scleractinians could be found on top of those carbonate mounds. During cruise 64PE284 of RV Pelagia, gravity cores have been taken through carbonate mounds in the Carbonate Mound Provinces (CMP) SE of Yuma mud volcano and N of Meknes mud volcano. These cores have been analysed by several methods such as Magnetic Susceptibility (MS), X-Ray Fluorescence (XRF), Inductive Coupled Plasma Optical Emission Spectroscopy (ICP-OES) and X-Ray Diffraction (XRD) to determine the geochemical characteristics of carbonate mounds, which can be used to quantify the effects of early diagenetic processes which may have altered the palaeo-environmental characteristics of the carbonate mounds. Dating has been done with ¹⁴C and U/Th methods pointing to mound growth phases being restricted to glacial periods.

XRF and ICP-OES measurements give both qualitative and quantitative data of the chemical composition of the core. The main elements that have been analysed are Ca, Si, Fe, Sr, Al, K, Mg, Ti. According to the trend they follow, they can be divided in two groups, representative for the two encountered fraction types. These two fraction types (biogenic carbonate-rich fraction and terrigenous silicate-rich fraction) can be coupled to interglacial/glacial palaeo-environmental conditions. XRD measurements give an overview of the mineralogical composition of the cores. Thin sections, analysed by cathodeluminescence and classical optical petrography, and micro-CT scans are used to investigate the influence of early diagenesis.

Along with the dating that has been performed, the obtained geochemical data give an overview of the extent to which palaeo-environmental conditions and diagenesis have influenced the carbonate mound sediments in the Gulf of Cádiz.

References

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