Geophysical Research Abstracts
Vol. 19, EGU2017-3034, 2017
EGU General Assembly 2017

Mineralogical influences on porosity-depth trends of shelf deposits (Miocene-Pleistocene) along the northwest shelf of Australia (IODP Expedition 356)

Wolfgang Knierzinger, Eun Young Lee, Michael Wagreich, and the IODP Expedition 356 shipboard scientists Team

Department of Geodynamics and Sedimentology, University of Vienna, Vienna, Austria (wolfgang.knierzinger@univie.ac.at (wolfgang.knierzinger@univie.ac.at)

Porosity in sediments is influenced by various factors such as mineralogical composition, burial depth, connate fluids, and stratigraphic layering. This work focuses on processes underlying porosity anomalies in carbonate shelf deposits along the northwest shelf of Australia by using different techniques (polarization microscopy, electron microscopy, XRD, XRF). IODP expedition 356 recovered cored seven sites (U1458-U1464), covering a latitudinal range of 29°S-18°S on the northwest shelf.
Strong negative deviations from general porosity-depth trends for these carbonate rich sediments are clear for samples with higher contents of dolomite, calcium sulfates, and non-skeletal calcite. No significant influence of aragonite on porosity values has yet been detected. However, it is likely that the occurrence of high amounts of aragonite is a crucial element with regard to porosity values in these carbonate rich deposits, since elongated aragonite needles commonly enhance interparticle porosity. Further insight might be gained through the application of electron microscopy.

In general, sediments in the northern part of the study area (Sites U1462, U1463, U1464) tend to show slightly higher porosity values compared to sediments form the south (Sites U1459, U1460). This may reflect the influence of calcium sulfate, because mineralogical analyses show, calcium sulfate is relatively rare at the southern sites, whereas higher amounts of calcium sulfates occur in the north. The lack of detrital particles in calcium sulfate components indicates an evaporitic origin. Deposits at Site U 1461 differ from other analyzed sediments insofar as higher amounts of feldspars and micas are apparent.

*This research is conducted within the frame of the 'International Ocean Discovery Program', funded by the Ministry of Oceans and Fisheries, Korea.