

study shows that their mineralogical composition consists mainly of dolomite, high magnesium calcite, quartz, feldspar and clays. Bioclasts of planktonic foraminifera (globigerinoids), ostracods and pellets are observed. Iron and manganese oxides are present and the cement is essentially biomicrite. In different samples from the same chimney a variation on the dolomite/calcite ratio is observed from the interior to the external part of the chimney. Values of dolomite show a variation from the interior to the exterior. Stable isotopic analysis of Carbon shown low $\delta^{13}\text{C}$ values (down to -46.88 ‰ vs. PDB) and $\delta^{18}\text{O}$ up to + 4.90 ‰ vs. PDB, typical values of methane as a major carbon source for the carbonate. SEM observations reveal microbes like structures which indicate that microbial activity has played an important role on the carbonates minerals production.

MINERALOGY AND GEOCHEMISTRY OF METHANE-RELATED AUTHIGENIC CARBONATES FROM THE GULF OF CADIZ, NE ATLANTIC

V. Blinova

UNESCO-MSU Centre for Marine Geology and Geophysics, Faculty of Geology, Moscow State University, Vorobjevi Gory, Moscow 119899 Russia, fu@geol.msu.ru

A number of carbonate crusts and chimneys were sampled during the TTR-12 cruise in the Gulf of Cadiz. Three main areas were studied: (1) Formosa Diapiric Ridge; (2) Jesus Baraza mud volcano; (3) fault zone near the Pen Duick escarpment. Sampled stations were chosen basing on the TV survey and acoustic data. All collected carbonates have different structure, mineralogical and chemical composition.

Underwater TV survey, acoustic and sampling data collected during the TTR-11 and TTR-12 cruises suggest that there are extensive fields of carbonate crusts and chimneys on Formosa Diapiric Ridge. Collected carbonate chimneys and slabs are brownish in color and well cemented. The carbonate cement is represented by dolomite. Microscopic analysis reveals a lot of quartz grains, quartzite and glauconite in the carbonate matrix. XRD analysis shows that their mineralogical composition mainly consists of dolomite and quartz (80%) with some admixture of calcite, magnesium calcite and clay minerals. Plankton foraminifera and some iron and manganese oxides were also observed. Individual chimney does not show big variation on petrology from the interior to the external part. Carbon isotopic composition varies from -24.5‰ to -39.6‰ PDB while oxygen isotopes are in range from -0.1‰ to +3‰ SNOW.

Authigenic carbonates retrieved from the Jesus Baraza mud volcano (AT390G), occurred in the form of irregularly shaped crusts. They are yellowish grey in color, porous and poorly cemented. The samples mostly consist of the aragonite (70%) with some admixture of calcite and magnesium calcite. Based on the description of thin sections and location of the crusts in the sediment sequence, samples were divided into two types. The first type consists of carbonates obtained from the surface of the mud volcano. They are more yellowish in color, which indicates oxygen rich environment. Carbonate crusts from the second type are located deeper in sediments at the depth of approximately 20 cm. They are grey in color, less porous and better cemented. $\delta^{13}\text{C}$ for both types is approximately -28‰ PDB and $\delta^{18}\text{O}$ is about +2‰ SNOW.

TV grab sample which was taken from the fault zone contained a lot of carbonate slabs. The carbonate slabs are represented by cemented biogermes, mostly consist of plankton foraminifera, shell debris, corals and pellets. XRD analysis shows that slabs consist of aragonite (18%), calcite (15%) and magnesium calcite (18%) with some admixture of quartz and clay minerals. Also two main types of crusts were recognized. One type is represented by grey well-cemented carbonates and the other is more yellowish but also very well cemented. The variations observed in mineralogical composition of these types are not significant. Carbon isotope composition is heavier than in previous station (from -9‰ to -15‰ PDB).