

## **THE COMPOSITION OF AUTHIGENIC CA-RHODOCHROSITES FROM SAPROPELIC SEDIMENTS: INDICATOR FOR OXYGENATION ANOXIC BASINS**

NEUMANN, T. and HEISER, U. Institute of Petrography and Geochemistry, University of Karlsruhe, Germany

The presence of Ca-rich rhodochrosite layers in sapropelic sediments of the central Baltic Sea have been related to inflow events of oxic seawater from the North Atlantic into the predominantly anoxic deeps of the central Baltic, by comparing the geochemistry of dated sediment cores with oceanographic observations. Surficial sediments sampled in high resolution, display significant Ca-rhodochrosite enrichments of 1.8 mol/kg at 65 mm, 1.5 mol/kg at 110 mm and 1.1 mol/kg at 150 mm sediment depth reflecting periods of intense seawater inflows in 1969-76, 1948-56, and 1931-39, respectively, suggesting synsedimentary formation at the sediment surface. The measured Mn/Ca ratios of rhodochrosites from 2.1 to 2.7 are in good agreement with thermodynamic energy minimisation calculations for  $\text{MnCO}_3$ - $\text{CaCO}_3$  solid solutions, and show that the composition of the aqueous solution is stoichiometrically controlled by Ca-rhodochrosite solubility. Negative  $\delta^{13}\text{C}$  values of -10.5 to -8.5 ‰ (VPDB) indicate that a main carbon source is biogenic, produced during anaerobic decomposition of organic matter.  $\delta^{18}\text{O}$  values of Ca-rhodochrosites range from -3 to -1 ‰ (VPDB) and suggest that rhodochrosite formation occurred during mixing of brackish Baltic Deep Water with saline waters from the North Atlantic. Higher variations in Mn/Ca ratios,  $\delta^{13}\text{C}$ - and  $\delta^{18}\text{O}$ -values of Ca-rhodochrosites sampled from deeper holocene sediments are used to constrain the conditions of authigenic Ca-rhodochrosite formation and its potential to reconstruct paleosalinities and the extent of oxygenation.