ABSTRACT

This thesis summarizes the results of geochemical investigations of deep sea sediment samples from the SW African continental margin. Elemental parameters as well as the amounts of marine and terrestrial biomarkers were used to reconstruct the variations of paleoenvironmental conditions in the study area during different time intervals.

A high downward flux of organic material under areas of high productivity led to organic carbon contents (TOC) up to 5% in the investigated sediment samples. Increased degradation of organic matter by microbial sulfate reduction is indicated by high sulfur contents (TS). Elevated ratios of stanols to stenols reflect low oxygen concentrations in the water column and in the sediments. Together with high TOC/TS ratios they point to an enhanced preservation of organic matter. The varying carbonate concentrations reflect changes in biological production of calcareous material, dilution by noncalcareous components, and carbonate dissolution fueled by oxidation of organic matter. The sediments from the main upwelling regions in the south consist mainly of carbonate (up to 85%), whereas the sediments north of the Walvis Ridge contain less than 25% carbonate. Carbonate concentrations are extremely low in sediments from the Congo Basin (average of the last 2 Myr is 2%). During glacials high TOC contents together with a heavier stable carbon isotopic composition of the organic matter points to an increased marine productivity.

Alkenone derived paleosea surface temperatures (SST) reflect global glacial/interglacial cycles. In some cases high sea surface temperatures were determined for glacial periods (e.g. oxygen isotope stages 12 and 6). The observed SST values do not support the theory that oxygen isotope stage 11 (OIS 11) was the warmest and/or the longest interglacial of the past 500 kyr.

Elevated concentrations of marine biomarkers (e.g. sterols) during glacial intervals indicate an increased marine productivity. Besides that high amounts of long-chain *n*-alkanes and *n*-alkanols point to an enhanced terrigenous supply of organic matter during cold and arid stages. On the basis of the average chain length (ACL) of the *n*-alkanes the contributions of C_4 plants were estimated. In late Quaternary sediments from the Angola Basin the values reach 30% of the terrestrial fraction and can therefore have a significant influence on the carbon isotopic composition of the bulk organic material. The ACL values do not reflect changes in vegetation in older sediments. Other climatic factors (e.g. temperatures) seem to be more important.