In the lower-most Oligocene, a formation of a continental ice sheet on Antarctica is postulated, which is mainly derived from a rapid, positive shift of the oxygen isotope values in tests of marine calcareous microfossils. The distribution of *Bolboforma* reacts upon this well-known climatic deterioration in the southern hemisphere at about 35.9 Ma in dependent of latitudes.

In late Eocene (40 Ma) *Bolboforma* shows a wide-spread extension in latitude. A successive, south to north disappearance of *Bolboforma* in the sites just after the oxygen isotopic shift at 35.9 Ma can be recognized. At about 34 Ma the biogeographic distribution of *Bolboforma* is only restricted to a small belt in middle southern latitudes. This characteristic distribution can be explained as a reaction of *Bolboforma* to a progressive cooling northward in the southern hemisphere.

$\delta^{18}O$-VARIATIONS IN DIAGENETIC SEQUENCES FROM ATLANTIC SEDIMENTARY BASINS

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Stable isotope analyses on DSDP/ODP-samples from Atlantic Ocean basins have been carried out to reconstruct the formation temperatures of calcite and chert at various burial depth levels. The effect of geothermal anomalies on authigenic mineralization.is of special interest in this context.

The carbon isotopic composition of concretionary calcite ($\delta^{13}C$=0.4 to 2.9‰) suggests dissolved primary marine carbonate to be the source for the diagenetic calcite. Using the calcite/water equilibrium, the oxygen isotopic composition of the calcite indicates maximum formation temperature of 50°C. It can be seen that the diagenetic carbonate formation gives no hints on unusually high heat flow in North Atlantic ocean basins. This is also obvious from the thermal gradients. Values of 3 to 6°C/100m derived from the formation temperatures are similar to the geothermal gradient.

On the other hand the oxygen isotopic composition of concretionary chert samples could reflect the influence of heat flow on silica precipitation. The $\delta^{18}O$ values range from 35.6‰ to 20.9‰. This accords to a temperature range from 11°C (24°C) to 86°C (102°C) depending on published equations. The calculated thermal gradients vary from 2.8 (3.9)°C/100m to 9.1 (14.5)°C/100m. In shallow subbottom-depths, far away from the basement temperatures, temperature gradients are in good agreement with those derived from the calcites. However, near the sediment/basement interface hydrothermally altered quartz reveal high mineral formation temperatures and steep thermal gradients possibly caused by unusual high heat flow during "hot times" of Atlantic Ocean basin formation.

FEATURES AND ORIGIN OF JURASSIC TO TERTIARY RADIOLARIAN CHERTS ASSOCIATED WITH OPHIOLITES IN SOUTHERN CENTRAL AMERICA

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The Nicoya Ophiolite Complex in southern Central America consists of tholeiitic basalts and volcanoclastic breccias formed during the Jurassic to Early Tertiary. The Lower Nicoya Complex is interpreted as oceanic crust accreted in a spreading ridge; the Upper Nicoya Complex consists of an oceanic intraplate