

Cold marine Patagonia waters and stable isotopes and trace elements from Quaternary mollusk shells

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Most of the Atlantic coast of Patagonia is dominated by the cold Falkland (Malvinas) current, whereas further north the upper level coastal circulation is characterised by the interaction with the saltier and warmer Brazil current.

The front of these currents changes seasonally and its position has probably been changed over a longer period of time.

Stable isotopes (¹³C/¹²C and ¹⁸O/¹⁶O ratios) and trace elements (Ba/Ca, Sr/Ca, Mg/Ca) have been used on mollusk shells preserved in fossil beach ridges for tracing past changes in the position of these two currents.

In particular, oxygen isotopic composition of *Mytilus edulis* collected from a Holocene beach ridge dated at ca. 6300 yr BP along the Bahia Camarones coast (Chubut Province, Argentina) is consistently different from the modern specimens and from Mytilidae samples collected from younger Holocene beach ridges and shell middens. On the contrary, the carbon isotopic values remain fairly homogeneous throughout the Holocene up to the present.

The changes in the oxygen isotopic composition of the shallow marine mollusk shells are consistent with changes in water temperature/salinity possibly related to fluctuations in the relative position between the Brazilian and Falkland currents, with a stronger influence of the warm and saltier Brazil current along the study area during the middle Holocene.

This is substantially confirmed by Mg/Ca ratio indicating an increase of the sea surface temperature during the middle Holocene in the Bahia Camarones area. It also found support on mollusk palaeontological data.

The effect of some new organic inhibitors on the oxidative dissolution of iron monosulfide (FeS)

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The effect of some new organic inhibitors on the oxidative dissolution of synthetic FeS at 25 °C in air-saturated HCl solutions (pH 1.3) was investigated by polarization and Electrochemical Impedance Spectroscopy (EIS) methods. The studied organic inhibitors were: 4-(5-bromo-2-hydroxyphenyl)-5-methyl-2-(morpholin-4-yl)-1,3-thiazol (Pr01); 4-(2-hydroxyphenyl)-2-(morpholin-4-yl)-1,3-thiazol (Pr02) and 1-(5-bromo-2-hydroxyphenyl)-1-oxaethan-2-yl-*N,N*-diethylthiocarbamate (Pr03). The used concentration of the inhibitors was 1 mM. The inhibition efficiency (IE) was computed by the following formula:

$$IE = (1 - i_{\text{corr}} / i_{\text{corr}}^0) \cdot 100$$

where i_{corr} and i_{corr}^0 are the corrosion current densities in the presence and absence of the inhibitor, respectively.

The best IE was observed for Pr01 (54 %). The other inhibition efficiencies were: 13% (Pr02) and 31% (Pr03). The interaction between FeS and the inhibitor with the best IE was analyzed by Raman spectroscopy, and the surface of reacted FeS was inspected under Scanning Electron Microscope (SEM).

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