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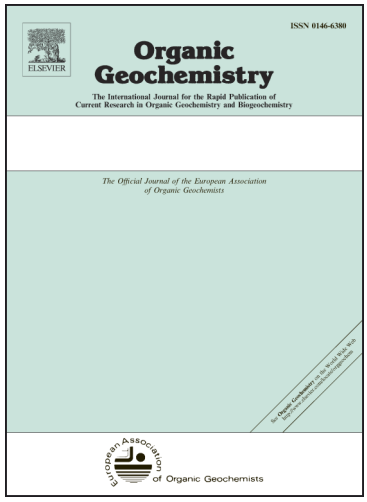

Rapid and simultaneous analysis of three molecular sea surface temperature proxies and application to sediments from the Sea of Marmara

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Rapid and simultaneous analysis of three molecular sea surface temperature proxies and application to sediments from the Sea of Marmara

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ABSTRACT

Reconstructing ocean temperature values is a major target in paleoceanography and climate research. However, most temperature proxies are organism-based and thus suffer from an "ecological bias". Multiproxy approaches can potentially overcome this bias but typically require more investment in time and resources, while being susceptible to errors induced by sample preparation steps necessary before analysis. Three lipid-based temperature proxies are widely used: $U^{K'}_{37}$ (based on long chain alkenones from phytoplanktonic haptophytes), TEX_{86} [based on glycerol dialkyl glycerol tetraethers (GDGTs) from pelagic archaea] and LDI (based on long chain diols from phytoplanktonic eustigmatophytes). So far, separate analytical methods, including gas chromatography (GC) and liquid chromatography (LC), have been used to determine these proxies. Here we present a sensitive method for determining all three with a single normal phase high performance LC column coupled to atmospheric pressure chemical ionization mass spectrometry (NP-HPLC-APCI-MS) analysis. Each of the long chain alkenones and long chain diols was separated