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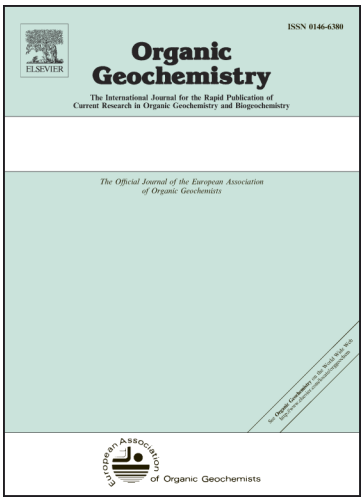

Improved Method for Simultaneous Determination of Saturated and Aromatic Biomarkers, Organosulfur Compounds and Diamondoids in Crude Oils by GC-MS/MS

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Improved Method for Simultaneous Determination of Saturated and Aromatic Biomarkers, Organosulfur Compounds and Diamondoids in Crude Oils by GC-MS/MS

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ABSTRACT

An improved GC-MS/MS method was developed for simultaneous determination of various types of molecular markers in whole crudes without the need for laborious group-type separation and discrete analyses of the diverse fractions. The ability to simultaneously identify and accurately quantify the numerous saturated and aromatic biomarkers, the organosulfur compounds (OSC) and the diamondoids in a single step was attained through use of expanded multiple reaction monitoring (MRM) transitions in specific time windows. The optimization was achieved through improving GC separation and selective choice of precursor and product ions, collision energies, dwell time, and time windows in the MRM settings. The method was tested using four crude oils of diverse types, densities and maturities: a heavy crude from Sicily (18° API), an intermediate-density crude from the Arabian Gulf (33° API), a light black oil from California (39° API), and a light condensate from Wyoming (53° API). The improvements were validated by checking accuracy and

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