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Detection of humic forms contribution to black carbon in marine sediments using BPCA as molecular markers

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Black carbon (BC) is an important component of natural organic matter that may play a significant role in global climate change. Usually difined as the highly condensed carbonaceous residue from incomplete combustion of fossil fuels and vegetation, it is an ubiquitous form of refractory organic matter widely distributed in the environment. The complexity of natural organic matter has resulted in a milieu of methods and accompanying BC values that make it difficult to delineate the proportion of BC in sedimentary total carbon budgets.

In this communication we present the estimation of black carbon obtained after the application of a chemical method on marine sediments, both in *coarse* and *without-humic-substances* state. The sediments, removed from the Southwestern Atlantic continental shelf of Spain, were subjected to an acid oxidation, using benzenopolycarboxylic acids (BPCA) as specific markers for black carbon (adapted Glaser et al. method, 1998). The analytical procedure includes acid digestion, oxidation, sample cleanup, derivatization and gas chromatography. Further, progressive chemical removal of extractable organic materials (lipids, humic and fulvic acids) were carried out with the sediments, to repeat the BC measurement on the samples without humic substances.

A comparison is established between the BC measured in both, original and humic-extracted sediments, in order to check if there is any little amount of this intermediate refractary organic matter fraction which contributes to the total BC value, as there are reports of considerable BC contents as *humic forms* (Simpson & Hatcher, 2004). The available results, related with BC measurements on the humic substances-free

samples, show values which are between 0.04-10.02 % BC/TOC.

Keywords: black carbon, refractory organic matter, marine sediments, humic substances, benzenepolycarboxylic acids.

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