Gustafsson, O, Bucheli, T.D., Kululska, M., Andersson, C., Largeau, C., Rouzard, J.N., Reddy, C.M. and Eglinton, T.I., *Evaluation of a protocol for the quantification of black carbon in sediments, soils, and aquatic sediments*, Global Biogeochem. Cycles. , 2001; v15, 881-890

Formation of highly condensed black C (BC) from vegetation fires and wood fuel combustion presumably transfers otherwise rapidly cycling C from the atm.-biosphere cycle into a much slower cycling geol. form. Recently reported BC fractions of total org. C (TOC) in surficial marine sediments span a wide range (2-90%), leaving it presently unclear whether this variation reflects natural processes or is largely due to method differences. In order to elucidate the importance of BC to C burial the specificity of applied methods needs to be constrained. The operating range and applicability of a commonly used chemothermal oxidn. (CTO) method is evaluated using putative BC stds., potentially interfering substances, and natural matrix stds. Test results confirm the applicability of the method to marine sediments. Integrity tests with model substrates suggest applicability to low-C soils but only with a lower specificity to seawater particulate matter. The BC content of marine sediment samples in a set of studies using the CTO method proved to be consistent with assocd. geochem. information. The radiocarbon content of the BC isolate in an environmental matrix std. was shown to be similar to the radiocarbon signature of pyrogenic polycyclic arom. hydrocarbons (PAHs), here serving as mol. markers of combustion (fraction modern fM of BC was 0.065±0.014 and of PAHs 0.056±0.020), while being clearly distinct from the radiocarbon content of the bulk TOC (fM = 0.61±0.08). Urgent questions such as the global accumulation rate of black C in soils and sediments may prove approachable with the chemothermal oxidn. technique of BC quantification.