Why Is It Easier to Determine PAHs than PCBs in Marine Sediments?

by Grażyna Kowalewska*, Joanna Konat and Świętosława Dobrowolska

Institute of Oceanology, Polish Academy of Sciences, ul. Powstańców Warszawy 55, 81–712 Sopot, Poland

Key words: PAHs, PCBs, marine sediments, analysis

Results of determination of polynuclear aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) in different reference materials — marine sediments — are presented. The analyses were performed according to an analytical scheme based on already partially published procedures. The results are discussed in comparison with the certificated data, known literature methods and own experience of authors to indicate why there are greater difficulties in determination of PCBs than PAHs, in this matrix. The most probable reason is that the physico-chemical properties of PCBs are more varied (like the molecular mass) or totally different (as lack of characteristic spectra in the UV–VIS range) than the relevant properties of PAHs. Therefore, there are some steps in the analytical procedure, usually neglected though very important, which decide about the observed higher discrepancies in intercalibrations of PCBs than those of PAHs. First of all, it is determination of extraction yield and clean-up of each particular compound being analysed, not group markers. The other is using chlorinated solvents and large quantities of solvents in extraction and clean-up procedures, leading not only to high blank values but to totally wrong results. The next is that samples from heavily polluted areas should be cleaned with great care from phthalates, occurring there in abundance, compounds of very similar chromatographic properties to PCBs and PAHs. The last, but not least point, is that integrators should be avoided in such analyses, only computer softwares displaying the way of integration may be used.

*Corresponding author. E-mail: Kowalewska@iopan.gda.pl