



A NEW TOOL FOR SITE INVESTIGATION: FAST GC/MS ANALYSIS OF BENZO [a]PYRENE IN SOIL

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Abstract

Benzo[a]pyrene (BaP) is an important parameter for toxicity classification of contaminated soil from former gas plants and many industrial sites. BaP [CAS No: 50-32-8] is a very low volatility compound and it is almost insoluble in water. The limited concentration according to legislation of many countries is about 10 mg/kg soil. This paper describes a new method and optimal parameters to analyze Benzo[a]pyrene (BaP) from soil matrices, using mobile GC/MS equipment. The aim is to analyse BaP on site in order to make decisions regarding the contaminated site in 15 minutes. The mobile GC/MS system (Bruker EM 640S) was used for this purpose. For development of the procedures and calibration, artificial samples including deuterised internal standards were analyzed and the US EPA 610 Solid Phase Extraction method was applied for a fast clean up step. Using these new parameters and fast GC/MS method, BaP is measured even in complex mixture of PAH, in soil samples from a German contaminated site with a detection limit of 0,5 ng in absolute amount. After the analytical steps this is equivalent to 0,4 mg/kg soil, so legislative requests can be fulfilled with high safety.

Keywords: fast GC/MS analysis, PAH soil contamination, solid phase extraction, Benzo[a]pyrene separation and detection, risks on environment and human health

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