

# A TESTED METHOD FOR SAMPLING AND ANALYSIS OF POLYCYCLIC AROMATIC HYDROCARBONS IN COMBUSTION PRODUCTS

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Much attention has been focussed on polycyclic aromatic hydrocarbons (PAHs) owing to environmental concerns and the health hazard associated with these compounds. They have been recognised as one of the largest classes of carcinogens known today. Even though PAHs can originate from natural processes such as volcanic eruptions and forest fires, anthropogenic activities have dramatically increased their concentration in the environment.

Since combustion of organic compounds is considered to be the main source of man made PAHs in the environment, the measurement of PAHs accurately in combustion products is important as far as regulatory and emission control aspects are concerned. The sampling and analysis of PAHs are formidable tasks for several reasons such as their existence in minute quantities in matrices and their association with many other compounds. In addition, they are present in combustion products in the gas phase and condensed onto the water vapour and particulates. Therefore, special techniques need to be adapted for the sampling and analysis of PAH. Although an ample amount of material related to the subject could be found in the literature, there is a considerable variation among the methods. Consequently, and also to suit the available facilities, a protocol for PAH sampling and analysis was developed and tested.

The sampling of the PAHs was carried out using a sampling train constructed mainly with glass. It consisted of a probe, which had been constructed to meet isokinetic sampling, a glass fibre filter, gas conditioning unit consisting of a circulating water jacketed condenser and a water trap, resin trap, an organic solvent trap, a silica gel trap, an air tight pump, a flow meter, and a gas meter.

The collected samples were extracted using organic solvents and then subjected to solvent exchange. The PAH fraction was separated using a simple silica gel column. The analysis was done using a GC/MS system. A modified Lee index was employed to confirm the identified compounds.