

## A proposed spectrofluorometric method for measuring Polycyclic Aromatic Hydrocarbons without interference

Hassan AWAD

Dept. Oceanography, Faculty of Sciences, Univ. of ALEXANDRIA (Egypt)

Because of simplicity as well as sensitivity of the UV-spectrofluorometry, it is commonly used with great success in the detection and determination of petrogenic polyaromatic hydrocarbons (PAH), (AWAD, 1989; HEROS, 1972; GREFFARD and MEURY, 1967). These compounds are of great value in properly the human environment, especially since many of them are proved to be carcinogen. From methodological point of view, although the usage of UV-spectrofluorometry is fairly sensitive, its specificity for the determination of any narticular PAH compound in a mixture is poor (SAWICKI *et al.*, 1960). In fact, the method is based simply on the fact that any PAH in a mixture has sharp characteristic absorption peaks which (in the case of prominent peaks) usually protrude above the background absorption of the mixture. The estimation of concentration of a Particular PAH in the mixture is usually accomplished by comparison of the intensity of the prominent fluorescence peak produced by the application of an excitation at certain wave length with that produced from a reference solution containing known amount of the measured compound. This is usually followed without considering the presence of other PAH compounds in the mixture having fluorescence bands close to that of the compound being analyzed which interferes with the accuracy of the technique.

The present article shows to what extent the presence of two polyaromatic hydrocarbons compounds (benzo-8,9-fluoranthene (BKF) and perylene (P)) is affecting the accuracy of UV-spectrofluorometry in the detection of the most potent carcinogen compound benzo-3,4-pyrene (BaP) (SONTAGE, 1981; HEROS, 1972). However, an analytical method depending on the complete activation and fluorescence spectral analysis is proposed. By following this method, detection and estimation of specific compound without interference of others could be successfully carried out.

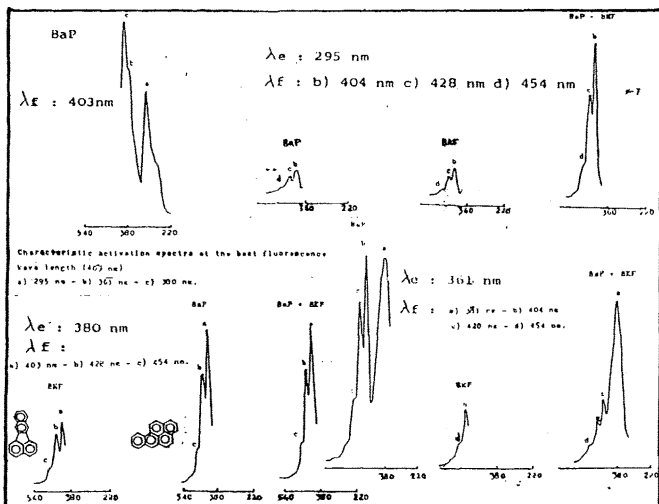
Practically, two experiments have been established. The first is devoted for examining the interference effect of the presence of BKF on the measurement of BaP using n-pentane as solvent, while the second for the detection and measurement of both BaP and perylene in mixture without interference of their measured fluorescence spectra using sulfuric acid as solvent.

The used instrument for the determination of activation and fluorescence spectra is Baird fluoripoint spectrofluorometer, Ratiometric RC 200.

The proposed method is simply based on complete analysis of BaP activation spectra in order to select one of them (even if it is not the best one producing the most intense fluorescence band) at which certain PAH compound could be determined without interference of other chemicals in a mixture.

For the determination of BaP in n-pentane solution containing BKF, it was found that BaP could be estimated at 381 nm fluorescence wave length through activation at 295 nm without interference of BKF. Throughout the same methodology, BaP could be determined without interference of perylene by applying a 283 nm activation wave length for their solutions in sulfuric acid. However, the two compounds could be detected separately at fluorescence bands corresponding to 385 and 396 nm respectively. The figure below include.

The figure below includes an example for the followed methodology in the case of detection of BaP and BKF without interference when they are present together.



### REFERENCES

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