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AC-P47**Synchronous Fluorescence Spectroscopic Technique:
The Tool for Rapid Identification of Polycyclic Aromatic
Hydrocarbons(PAHs) At Sub-ppm Level in Liquid Samples**

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Objective

To develop fluorometric method for rapid qualitative analysis of PAHs in liquid sample.

Methods

Synchronous scanning fluorescence spectra at various wavelength interval ($\Delta\lambda$) of each polycyclic aromatic hydrocarbons (namely, fluorene, truxene, benzo(k)fluoranthene, carbazole, chrysene, anthracene, acenaphthene and indeno(1,2,3,cd)pyrene) at sub-ppm level were recorded and compared with the Synchronous scanning fluorescence spectra of the synthetic mixture solution of PAHs.

Results

Each PAHs give characteristic synchronous fluorescence spectra at various wavelength interval ($\Delta\lambda$) due to the difference in chemical structure of each PAHs. The characteristic peak of fluorene, truxene, benzo(k)fluoranthene, carbazole and anthracene begin to appear when $\Delta\lambda$ is less than 10 nm. For acenaphthene and chrysene, the characteristic peaks appear at $\Delta\lambda$ equal to 10 nm and higher than 30 nm respectively. These suggested that six PAHs including benzo(k)fluoranthene, carbazole, chrysene, anthracene, acenaphthene and indeno(1,2,3cd)pyrene can be separated qualitatively by synchronous scanning fluorescence. It was found that this technique can be used to identify PAHs in liquid sample containing three or six types of PAHs such as fluorene, truxene, benzo(k)fluoranthene, carbazole, chrysene, anthracene, acenaphthene and indeno(1,2,3,cd)pyrene.

Conclusion

This work demonstrated that the synchronous scanning fluorescence method can be used as a tool for the rapid identification of PAHs in liquid sample.

Keywords: polycyclic aromatic hydrocarbons, synchronous scanning, spectrofluorometry

Selected References:

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