

## **Critical Assessment and Source apportionment of Particulate bound-PAHs in Indoor Air of South Asian precinct**

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Although many researchers in recent times have been working on the chemistry and composition of Indoor air quality, yet, source determination and nature of pollutants is still a comprehensive area to be explored. With the above stated objective, the present study emphasizes on 16 USEPA specified PAHs which are allied with particulate matter. Both PM as well as PAHs are some very common and treacherous chemical contaminant accountable for more than a million death globally. PAHs are organic compound which are either attached to PM of various sizes or can exist in gaseous form. Current work precises the concentration of PAHs associated with fine PM i.e., PM<sub>2.5</sub> in indoor environment of south Asian precinct (1), further, using receptor modelling technique for determination indoor sources responsible for the emanation of specific PAHs(2). The toxicity equivalent quotient i.e., TEQ evaluated in the study demonstrates that the highest toxicity among all PAHs is exhibited by BaP followed by InP, BbF, BkF. Seasonal variations in the concentration of PAHs and their respective sources were also established using PMF models, which depicted the domination of 3-ring PAHs in winter with 42% contribution in outdoors, whereas, four-ring PAHs dominion in indoors. Similarly, in summer two-ring accounted for 35% in outdoors, and three-ring PAHs contributed highest with 26.8% in indoors. In monsoon PAHs with two-ring contributed highest with 45.2% in outdoors, whereas, 2-ring PAHs contributed 38.3% in indoors. Also, IDW mapping and molecular diagnostic ratio were assessed for an intense study on distribution of PAHs in the locality and the source apportionment purpose respectively. To the best of our knowledge, the study is first of its kind in this part of the world where, majority of the countries are either developing or under-developed and hence at greater risk to the noxious effects which are often overlooked. The study will provide a clear picture regarding the indoor sources of the PAHs and further help the further professionals to build a credible and pragmatic mitigation technique accordingly.

**Keywords-** Polycyclic aromatic hydrocarbon, positive matrix factorization, toxicity equivalent quotient, indoor air pollution, molecular diagnostic ratio, IDW mapping

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