

## **Airborne Particulate Matter Passive Samplers for Indoor and Outdoor Exposure Monitoring: Development and Evaluation**

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**Abstract :** The Middle East area is highly affected by air pollution induced by anthropogenic and natural phenomena. There is evidence that air pollution, especially particulates, greatly affects the population health. Many studies have raised a warning of the high concentration of particulates and their affect not just around industrial and construction areas but also in the immediate working and living environment. One of the methods to study air quality is continuous and periodic monitoring using active or passive samplers. Active monitoring and sampling are the default procedures per the European and US standards. However, in many cases they have been inefficient to accurately capture the spatial variability of air pollution due to the small number of installations; which eventually is attributed to the high cost of the equipment and the limited availability of users with expertise and scientific background. Another alternative has been found to account for the limitations of the active methods that is the passive sampling. It is inexpensive, requires no continuous power supply, and easy to assemble which makes it a more flexible option, though less accurate. This study aims to investigate and evaluate the use of passive sampling for particulate matter pollution monitoring in dry tropical climates, like in the Middle East. More specifically, a number of field measurements have be conducted, both indoors and outdoors, at Qatar and the results have been compared with active sampling equipment and the reference methods. The samples have been analyzed, that is to obtain particle size distribution, by applying existing laboratory techniques (optical microscopy) and by exploring new approaches like the white light interferometry to. Then the new parameters of the well-established model have been calculated in order to estimate the atmospheric concentration of particulates. Additionally, an extended literature review will investigate for new and better models. The outcome of this project is expected to have an impact on the public, as well, as it will raise awareness among people about the quality of life and about the importance of implementing research culture in the community.

**Keywords :** air pollution, passive samplers, interferometry, indoor, outdoor

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