Monthly analysis of PM10 in ambient air of Klang Valley, Malaysia

ABSTRACT

The urbanization in Klang Valley, Peninsular Malaysia over the last decades has induce the atmospheric pollution's risk resulted to negative impact on the environment. The aims of this paper are to identify the spatial-temporal relationship of particulate matter (PM_{10}), to determine the characteristic of each location and to classify hierarchical of the location in relation to their impact on PM_{10} concentration in Klang Valley. The Spearman correlation test indicate that there was strong significant relationship between all the locations (> 0.7; $p < 0.001$) and moderate relationship between Petaling Jaya-Kajang and Kajang-Shah Alam (< 0.7; $p < 0.001$). The principal component analysis (PCA) identifies all four locations have been affected by PM_{10} which were determined as one of the pollutant that deteriorated the air quality. Cluster analysis (CA) has classified the PM_{10} pattern into three (3) different classes; Class 1 (Klang), Class 2 (Petaling Jaya and Kajang) and Class 3 (Shah Alam) based on location. Further analysis of CA would be able to classify the PM_{10} classes into groups depending on their dissimilarities characteristic. Thus, possible period of extreme air quality degradation could be identified. Therefore, statistical and envirometric techniques have proved the impact of the various location on increasing concentration of PM_{10}.

Keyword: Particulate matter; Spearman correlation test; Principal component analysis; Cluster analysis