EVALUATION OF GASEOUS POLLUTANTS IN SELECTED TRAFFIC ROAD INTERSECTIONS INUMUAHIA, ABIA STATE, NIGERIA.

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ABSTRACT

The study primarily examined the levels of carbon dioxide (CO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), sulphur dioxide (SO_2),and particulate matter ($PM_{2.5}$, PM_{10}suspected to arisefrom vehicular emissions. The study was done during the wet season (May – June) in Umuahia Abia statesouth eastern Nigeria.Sampling of air was in peak and off-peak periods using sensitive gas monitors at selected traffic points in study area which include Umuahia Gate, Umudike Junction, Bende Road Junction and control location at Dozie Way Junction. The number and types of vehicles travelling through the study area were counted at each location for 1hour during the peaks and off-peak periods of sampling respectively. Results reveal that Umuahia Gate recorded the highest concentrations of CO (37ppm), SO_2 (0.47ppm), NO_2 (0.48ppm), $PM_{2.5}$ (27.60ug/m^3), PM_{10} (9.20ug/m^3), CO_2 (689ppm), at RH (70%), Temp. (30^{o}c) and wind speed (2.6m/s) while Dozie Way Junction (control) is appreciably low. When compared with U.S National Ambient Air Quality Standards and Nigerian National Ambient Air Quality Standards, exceedances of these standards were observed. Daily air quality index of the study area implicated CO as the pollutant causing a “very unhealthy” air quality around the study area. Results of correlation showed that the number and types of vehicles are the primary influence determining ambient pollutant concentrations in the study area.

Keywords: vehicular emission, air quality index, air pollutants, traffic congestion