



Measurement and analyses of concentrations of methane (CH₄) and nitrogen-dioxide (NO₂) gases at a quarry site.

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Abstract:

Measurement and analyses of the concentrations of NO₂ and CH₄ gases in ambient air at Setraco quarry site, Abia State, Nigeria (latitude 05°33'N and 06°03'N, and longitude 10°E and 07°29'E) were carried out in this study. The gases were measured using two automatic air samplers namely EM-4 Type Multi-P detector and AIKE EM-201 Gas meter. The measurements were made at three sampling points; the engine house, petrol station and crushing site for 12 weeks (7th August – 6th November, 2017) at one (1) hour interval per session for three sessions (morning, afternoon and evening) in a day. It was observed that at petrol station, the mean concentration of methane was highest with a value of 3.14±0.8% which is much higher than World Health Organization (WHO) recommendation of 0.1% exposure limit for 8 hours working time. The lowest mean concentration at the petrol station was 0.39±0.08% which is still quite high and above deleterious level or the WHO acceptable limit. At the Engine House, the highest mean concentration of NO₂ measured was 375±4.0ppm, which is higher than World Health Organization (WHO) and Federal Environmental Protection Agency (FEPA) acceptable limit of 4.89ppm for weekly mean concentration. The Air quality index (AQI) calculation for the NO₂ concentration of 375±4.0ppm yielded a health-threatening value of 153 especially for people with heart and breathing problem. These results imply that NO₂ is emitted more at the Engine house, less at the Petrol station and much less at the Crushing site while CH₄ is emitted more at the Petrol station than Engine house and Crushing site.

Biography:

Orji Prince Orji has a Masters Degree in Atmospheric Physics from Abia State University, Uturu, Nigeria. He is currently undergoing a PhD programme (with a research interest in “dampening of signal strength for propagation



due to atmospheric constituents) in same institution. Orji is currently an academic staff of the University of Nigeria. He has published five (5) journal papers with reputable journals.

Publication of speakers:

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Webinar On Earth & Planetary Science | July 22, 2020 | Toronto, Canada

Citation: Orji Prince; Measurement and analyses of concentrations of methane (CH₄) and nitrogen-dioxide (NO₂) gases at a quarry site; *Geology* 2020; July 22, 2020; Toronto, Canada