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ASSESSMENT OF ORGANOPHOSPHATE FLAME RETARDANTS IN AIR SAMPLES FROM AN ELECTRONIC WASTE DUMPSITE IN LAGOS, NIGERIA

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In developing countries, recycling of electrical and electronic waste (e-waste) has attracted much attention as a significant source of flame-retardants. In this study, ten air samples were collected in 2022 from five different locations to include an electronic waste dumpsite and control site in Lagos, Nigeria; to investigate the occurrence of a range of 7 congeners of Organophosphate Flame Retardants (OPFRs) which include tris(2-chloroethyl) phosphate (TCEP), tris(2- chloroisopropyl) phosphate (TCIPP), tris(1,3-dichloro-2-propyl) phosphate (TDCIPP), amongst others.

The highest mean concentration of OPFRs was found in the indoor repair and storage shop (12,770 pg/m3); followed by the indoor dismantling shop (10,505 pg/m3). TCIPP had the highest mean concentration for all samples (15230 pg/m3), followed by TCEP (15,040 pg/m3) while the least was EHDPP (257 pg/m3). Although all target compounds were detected in both target and control sites, but the concentrations from outdoor samples were comparatively lower than the indoor air samples; and concentrations from the control sites were lower compared to target sites. This suggests that accumulation of electronic wastes contributes immensely to the concentration as well as exposure to OPFRs.

This study reports for the first time occurrence of OPFRs in atmospheric samples from e- waste dumpimg site in Lagos, Nigeria.

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