NANOPARTICLES EFFECT ON ROOF-TOP COLORATION: AN ATTEMPT AT UNDERSTANDING THE NATURE OF DRY AIR DEPOSITION ON ROOFTOPS IN UYO METROPOLIS

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ABSTRACT

The study Nanoparticles Effect on Roof-Top Coloration: An Attempt at Understanding the Nature of Dry Air Deposition on Rooftops in Uyo Metropolis has been extensively undertaken. The study considered four different study areas in Uyo metropolis viz station 1 (University Main campus), station 2 (Use Offot on Nwanniba road), station 3 (:Ikot-Okubo on Abak road) and station 4 (Mbaibong on Oron road). Dry air sampling was carried out in the four stations using Attair 5x, and the condition of the roofs were noted and examined. The samples from the roofs were taken for SEM micrographs and scraped material from the roof was analysed using EDX-X-Ray Fluorescence. The suspended particulate matter in the dry air in all the four stations was also determined using High Volume Sampler. The various particle sizes of the SPM from the dry air which ranged from nano to micro –sizes were digested and analysed for some selected elements which included lead, iron, cadmium, zinc, copper, and sodium. The study revealed the nature of pollutants from the dry air in the four stations to be gaseous pollutants and suspended particulate matter (SPM). From the result of the work it was established that the SPM from the dry air had effect on the rooftops of buildings in Uyo metropolis as both the nano-size and micro-size of the SPM from the dry air were deposited on the rooftops leading to the coloration (dark-black) of the rooftops. The composition of the sampled dry air and the SPM was compared with that of the dark-black material to establish that the dark black deposit was actually from the dry air. The study also noted that the composition of the SPM may have some health implications since the lead content in station 3 was higher than specification from air quality standard of 0.00038 ppm. The scanning electron microscope micrograph of the rooftops, show the dark- black deposit as it covers the roof, with dark areas representing where the deposit was thick on the roof, and shining-light areas representing where the deposit was thin on the roof.

Keywords: Dry air, Particulates, Nano-size, Inhalable particles, Rooftops, Nature.