

Particle Concentration Distribution under Idling Conditions in a Residential Underground Garage

Authors : Yu Zhao, Shinsuke Kato, Jianing Zhao

Abstract : Particles exhausted from cars have an adverse impacts on human health. The study developed a three-dimensional particle dispersion numerical model including particle coagulation to simulate the particle concentration distribution under idling conditions in a residential underground garage. The simulation results demonstrate that particle disperses much faster in the vertical direction than that in horizontal direction. The enhancement of particle dispersion in the vertical direction due to the increase of cars with engine running is much stronger than that in the car exhaust direction. Particle dispersion from each pair of adjacent cars has little influence on each other in the study. Average particle concentration after 120 seconds exhaust is 1.8-4.5 times higher than the initial total particles at ambient environment. Particle pollution in the residential underground garage is severe.

Keywords : dispersion, idling conditions, particle concentration, residential underground garage

Conference Title : ICEPR 2015 : International Conference on Environmental Pollution and Remediation

Conference Location : Istanbul, Türkiye

Conference Dates : January 26-27, 2015