Indoor airborne nanoparticle measurement by Diffusive Charging (DC) and Aerodynamic Particle Focusing (APF): Characterization of the performance of the corona charger

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The combination of diffusive charging (DC) and aerodynamic particle focusing (APF) was used to measure nanoparticle size distribution in indoor environments. It was speculated that the corona charger generated nanoparticles during the charging process that affected the performance of the prototype. The experimental investigation was carried out to determine the characterization of generated nanoparticles in the corona charger. Results show that the generated nanoparticles had the size range below about 60 nm, regardless of the electric field intensity. Meanwhile, feed aerosol particles could be filtered by the corona charger as well. The calibration curve was developed and used to correct the measured data by the new prototype by considering the effect of nanoparticles filtration and generation in the corona charger. The prototype was compared against SMPS for the size range of 40-300 nm.