

Novel air cleaning technologies for indoor air quality using electrostatic precipitation with near-zero ozone generation

Hak-Joon Kim, Bangwoo Han, Changgyu Woo, Yong-Jin Kim
1) Dept. of Environmental Machinery
Korea Institute of Machinery & Materials
phone: (82) 10-5175-9220
e-mail: diayolk@kimm.re.kr

Abstract—As Asian public interest in particulate matter against human health increased, Asian market for air purifiers such as China, India and Korea etc is growing fast and a demand for new air purifiers which can be used in small spaces, such as small room and inside of vehicle is also growing. In this study, a novel electrostatic precipitator (ESP) type air purifier using carbon brushes as an ion emitter to room air, parallel collection plates, and a suction fan was suggested and investigated to overcome disadvantage of general ESP type air purifiers to generate ozone as byproducts. Experimental results showed that the particle clean air delivery rate (CADR) of the novel ESP of 0.863 m³/min is significantly high, approximately 5 times higher than a HEPA filter type air purifier (0.18 m³/min), while it generates near zero ozone, negative ions of approximate 10 x 10⁶ #/cc which induce maximum 3 charges per particle. It is concluded that this novel ESP air cleaning mechanism indoors could be very useful due to high particle cleaning performance while emitting negative ions and generating zero ozone.

I. ACKNOWLEDGEMENT

This work was supported by the Technology development Program [S2495897 (AI2920)] funded by the Ministry of SMEs and Startups (MSS, Korea), and also partially by the Basic Research Fund (SC1250, NK212E) of the Korea Institute of Machinery and Materials.