

Effect of Ventilation Rate on the Removal of ETS Components

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ABSTRACT : This study was conducted to evaluate the ventilation rate to remove gases, vapor, and particles from a room contaminated with environmental tobacco smoke(ETS). The ventilation rate choosed were 0.445 m³/min, 0.528 m³/min, and 0.625 m³/min. The ETS measurements covered total suspended particle(TSP), ultraviolet particulate matter(UVPM), fluorescent particulate matter(FPM), solanesol, and the following gases and vapor : CO₂, CO, nicotine, and 3-ethenylpyridine(3-EP). All of ETS components sharply decreased as increasing ventilation rate, but the removal efficiency were different from each ETS compounds. CO₂, and CO, gaseous components of ETS, were most dominant components to remove from the room by ventilation. Only 1 hr venilation with 0.528 m³/min had an effect to remove over 99% of those gaseous component. Nicotine and 3-EP needed 2 hrs to reduce over 95% of those components by same ventilation rate. As 99% of TSP and solanesol concentration were removed from the room by 2 hrs ventilation with 0.528 m³/min, UVPM and FPM concentration were decreased 90% by same ventilation rate and time. Our result indicate that ventilation is very effective method to remove ETS components from the indoor air, and be the reasonable solution of indoor air pollution problems.