Smoke clearing method using activated carbon and natural zeolite

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Abstrak

The purpose of this research is to study the effectiveness of smoke clearing with adsorbents measured in situ using the photoelectric type smoke detection system. The influence of the type, size and the mass of the adsorbents was evaluated against the smoke clearing process. Adsorbent types studied were commercial activated carbon, ZnCl2-activated carbon, and activated natural zeolite, with the size of 0.6-1.0 ?m, 1.0 to 2.0 ?m, 53-106 ?m, and 106-212 ?m, and the mass of 1, 3, and 5g. The smoke was generated by burning tissue paper using an electrical soldering apparatus. The adsorbent was dispersed using a pressurized nitrogen system. The results showed that in comparison with no adsorbent, the activated carbon and natural zeolite were more effective for clearing the smoke. The order of clearing effectiveness was best achieved by commercial activated carbon, ZnCl2-activated carbon and activated natural zeolite, respectively. Particle size of 53 micron provided the most effective performance. The more mass of adsorbent dispersed, the faster the clearing process. Clearing process at the top of the column was faster than that at the bottom. The best t10 value obtained for the top, middle and bottom column were 4, 4.6, and 7.7 minutes, respectively. In addition, the average adsorption of carbon monoxide was less than 15%.