

Preparation and Characterization of Combi Cabin Air Filter Containing Activated Carbons

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Activated carbon(AC) is widely used in air purification as an absorbent which can remove pollutant from air, because it is porous and has large surface. Therefore, Nonwoven-based filter media with AC layer can protect against harmful airborne contaminants as separating both fine solid particles and harmful gases from air. In this study, a combi cabin air filter for passenger car was prepared from nonwoven composite medium consisting of non-woven and porous activated carbon. The AC layer was prepared by firstly scattering granular AC uniformly in a support nonwoven fabric, secondly covering the AC layer with carded fiber web and finally bonding thermally through heated belts. The meltblown nonwoven which consist of fine fibers with 3~5 μm was adhered to the prepared AC layer by a hot-melt spray method. The composite nonwoven filter media containing AC was pleated and fabricated to be a combi cabin filter unit. The filter media and filter unit were characterized in terms of pore size distribution, air permeability, air flow resistance, particle filtration efficiency, hazardous gas removal, and so on. The filter unit showed the high filtration efficiency (81% @ 0.3 μm solid particle, toluene removal efficiency 80.5%) and the low air flow resistance (9.6 mmAq @ 300 m³/h).