

# **Synthesis and characteristic of the ion exchanger for selective removal of aldehyde compounds in mainstream smoke**

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To use the filter material for selective reduction of aldehyde compounds in cigarette mainstream smoke, ion exchangers were synthesized by polymerization and functionalized by sulfonation and amination, respectively. 2R4F Kentucky reference cigarettes were used to investigate selective adsorption properties of those ion exchangers to aldehyde compounds in mainstream smoke. To derive the optimum adsorption condition, we changed the adsorbent type and water contents. The adsorption amount of aldehyde compounds of the anion exchanger was higher than those of the cation exchanger in dry conditions. The different adsorption capability was caused by electron delocalization in the carbonyl group. The adsorption efficiency was increased in the presence of moisture. This result indicates that the ion exchanger is available to use as a cigarette filter material because of the large ion exchange capacity and rapid ion exchange reaction.