## A strategy for constructing highly efficient Co3O4-C@SiO2 nanofibers catalytic membrane for NOx-SCR and dust removal

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## Abstract

The strategy of constructing catalytic membrane has a significant influence on its structure and performance. In this work, Co3O4-Cx@SiO2 nanofiber membranes (NFMs) were fabricated by an in-situ growth-pyrolysis-oxidation strategy. The Co3O4-Cx catalyst derived from ZIF-67 was wrapped around nanofibers, which helps to maintain a stable membrane structure, then suppressing the reduction of gas permeability. Among the Co3O4-Cx catalyst, the carbon skeleton can prevent the agglomeration of Co3O4 nanoparticles, obtaining an ultra-fine Co3O4 nanoparticles with high dispersibility, redox property and surface area. The obtained Co3O4-C300@SiO2 NFM exhibits excellent filtration efficiency and low pressure drop for PM2.5 (99.99% and 55 Pa) and outstanding catalytic performance with T90 of 245 °C for NH3-SCR, which is 40.3% higher than that of Co3O4@SiO2 NFM. This work might provide a universal strategy for the preparation of catalytic membrane with high-performance.

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