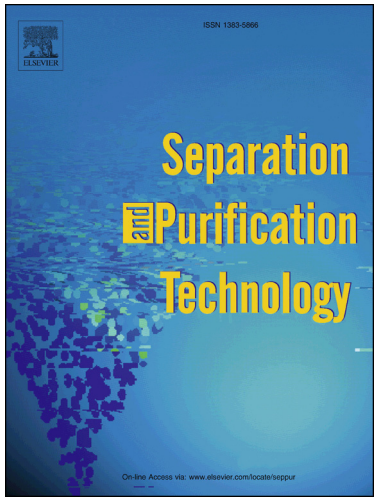

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Catalytic Combustion of Isopropanol over Co-Mn Mixed Oxides Modified ZSM-5 Zeolite Membrane Catalysts Coated on Stainless Steel Fibers

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Abstract: A novel gradient porous Co-Mn mixed oxides modified ZSM-5 zeolite membrane/PSSF (paper-like stainless steel fibers) catalyst was prepared for catalytic combustion of isopropanol in a membrane reactor. First, the paper-like sintered stainless steel fibers (PSSF) support was fabricated by wet lay-up papermaking method and sintering process. Then, ZSM-5 zeolite membranes were synthesized on the surface of stainless steel fibers by using secondary growth process. Finally, the cobalt and manganese mixed oxides modified ZSM-5 zeolite membrane catalysts were prepared by wet impregnation method. These novel modified membrane catalysts were characterized by using SEM, XRD, N_2 adsorption–desorption isotherms and XPS, respectively. The catalytic activity test was carried out over a membrane reactor filled with ZSM-5 zeolite membrane catalysts and granular catalysts, respectively. The experimental results showed that the junctures of stainless steel fibers were completely sintered together to form a three-dimensional network structure and ZSM-5 zeolite membrane was fabricated on the PSSF support with the thickness of 1.78 μm. The cobalt element existed as Co^{3+} and Co^{2+}， maganese element existed as Mn^{4+} and Mn^{3+}. The results of catalytic activity tests showed that catalytic activity for isopropanol over ZSM-5 zeolite membrane catalyst was superior to that over granular ZMS-5 catalyst,

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