REMOVAL OF p-XYLENE BY A DBD-TYPE PLASMA COMBINED WITH CATALYST

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Abstract

The removal efficiency of p-xylene from gas stream was experimentally investigated in a dielectric barrier discharge (DBD) reactor, which was combined with catalyst, MnO2/Al2O3 pellets, in the discharging and the afterglow area, respectively. The CO2 selectivity of the two kinds of structure was also discussed. The results showed that in both the situation, the synergetic removal efficiency of p-xylene by the DBD-catalyst hybrid system increased with increasing the discharge power and decreasing the initial p-xylene concentration, reached the maximal value when discharge gap width was fixed at 3 mm (when catalyst was combined in the discharging area) or 4 mm (when catalyst was combined in the afterglow area) and the humidity content in the gas stream was controlled at 1.6% by volume. But under all the treatment conditions mentioned above, the combination of DBD with catalyst located in the downstream could produce intenser synergetic effect on p-xylene removal and higher CO2 selectivity.

Key words: dielectric barrier discharge, catalyst, p-xylene, synergetic efficiency

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