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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, MnO_2/Al_2O_3 pellets, in the discharging and the afterglow area, respectively. The CO_2 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 CO_2 selectivity.

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

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