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Formaldehyde Abatement by Atmospheric Plasma and Catalyst

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Abatement of formaldehyde by non-thermal plasma produced by direct-current positive streamer corona discharge in multi point-to-plane reactor was studied experimentally. The removal efficiency of formaldehyde and the formation of products were evaluated as functions of the input concentration, the gas flow rate, the discharge polarity and discharge mode. The effects of various pellets placed inside the reactor, in the combination with plasma or without it were investigated. The discharge properties, chemical process and formed by-products were found influenced by the processes of adsorption and plasma-assisted catalytic reactions. Compared to individual treatment by the plasma or pellet catalysts, the improvement of the abatement efficiency was observed for plasma combined with TiO_2 and $\gamma\text{-Al}_2\text{O}_3$, especially at relatively high input energies and long-term operation.

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