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Plasma-in-honeycomb for the Selective Catalytic Reduction of Nitrogen Oxides with Hydrocarbon[1] YOUNG SUN MOK, DUC BA NGUYEN, NOSIR MATYAKUBOV, SAUD SHIRJANA, Jeju National University, ILJEONG HEO, Korea Research Institute of Chemical Technology — Plasma-assisted catalyst reduction of NO_x is an effective exhaust gas treatment method at low temperatures. Compared to traditional catalyst, the energy can be more efficiently used when the plasma is combined. To date, most of plasma-catalytic studies on NO_x reduction have been investigated in DBD or packed-bed reactors with a narrow discharge gap. Environmental catalysts should be able to treat a large flow rate, but there are several bottlenecks for practical applications of the packed-bed or DBD-based systems in terms of pressure drop and scale-up, though the plasma-catalyst combination has been demonstrated to be successful in small-scale systems. Such problems can be overcome by using honeycomb catalysts. A honeycomb catalyst can avoid the pressure drop and allow a large flow rate. In this study, corona plasma discharge in honeycomb catalyst has been investigated for improving the catalytic activity at low temperatures. The corona discharge is created with two perforated disks serving as high-voltage and ground electrodes. The optimal condition for corona discharge inside the honeycomb channels is determined, and then the effect of various parameters on the NO_x reduction is examined

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