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Abstract #61 | Poster

Decomposition of large flow toluene using multilayer dielectric barrier discharge

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Volatile organic compounds (VOCs), as one of the major air pollutants, are emitted at a large flow rate and low concentration in general, from various industrial sectors such as painting, construction work, printing, degreasing cleaning, etc. [1] Typical measures for processing VOCs are the combustion and the adsorption method. However, neither is suitable for VOCs processing of industrial emissions as the former consumes too much energy or the latter cannot handle large flow rates due to high running costs. Accordingly, a novel processing method for large flow rates and low concentration with low energy consumption is demanded, in the meanwhile, the method using dielectric barrier discharge (DBD) plasma is a prospective approach.

Previously, we have developed DBD processing devices for VOCs decomposition. Even though the processable flow rate of 50 L/min with a decomposition rate of 90% was attained in toluene-mixed air decomposition, much larger flow rates are still required in terms of practicality. Therefore, in this study, a DBD device with a multilayer configuration featured with 10 layers, where each layer is 200 mm-long, 100 mm-wide, and 2 mm-thick, is developed for larger flow rates decomposition. Moreover, its performance such as decomposition rate at a range of flow rates: 50 ~ 1000 L/min and corresponding characteristics are investigated.

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References

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