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Reaction mechanism of hydrogen generation from ammonia by DBD pulsed plasma TOKO KAWAOKA, YU INOUE, SHINJI KAMBARA, Gifu University — Ammonia has a number of favorable characteristics, the primary one being its high capacity for hydrogen storage, 17.6 percent, based on its molecular structure. The secondary advantage is that ammonia is carbon-free at the end users, although CO2 emission on production of ammonia is dependent on the source of energy. Therefore, ammonia is the promising chemical species as a hydrogen carrier. The purpose of this study is to clarify the elementary reaction mechanism of hydrogen generation from ammonia by DBD pulsed plasma. Effect of applied voltages, gas flow rates and concentration of ammonia was investigated, and then behavior of hydrogen generation in the DBD reactor was calculated using an elemental chemical reaction model. Analysis of reaction pathways indicated that reaction rate of hydrogen generation by ammonia decomposition in the DBD reactor was 10E9 times faster than the usual thermal decomposition.

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