

Gliding Arc Plasma Processing for Chloromethane Decomposition

Antonius Indarto, 최재욱, 이화웅, 송형근*
한국과학기술연구원
(hksong@kist.re.kr*)

Chlorinated volatile organic compounds play an important role in the chemical industry both as reaction intermediates and final products. The increasing amounts of chlorinated VOCs released into the environment, together with their suspected toxicity and carcinogenic properties, have increased the demand for finding effective methods of destruction. In order to get high decomposition performance of chloromethane compounds (such as: CH_2Cl_2 , CH_3Cl , and CCl_4), gliding discharge plasma was used as attractive method due to producing high quality of radical species. The decomposition performance was studied relating to various concentrations of chloromethane, total gas flowrate, and power consumption. 0.5 L quartz cylindrical reactor, with two stainless steel plates electrode, and high voltage AC power supply were used to achieve the goal of this study. For CCl_4 decomposition, it reached 80% (1% of CCl_4 at total flowrate 3 lpm) and the main products were Cl_2 (selectivity ~77%), CO , and CO_2 . Conversion of CHCl_3 reached 97% at 1% of CHCl_3 and total flowrate 3 lpm. The main products were Cl_2 , CCl_2O , CO_2 and CO . And, for CH_2Cl_2 , the conversion reached 90% at 2.5% of CH_2Cl_2 and total flowrate 5 lpm.