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Decomposition of CO_2 in atmospheric pressure barrier discharge (analytical review)

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An analytical review of the results of studies of the decomposition of carbon dioxide in a barrier discharge at atmospheric pressure is presented. The decomposition of carbon dioxide CO_2 in a barrier discharge occurs under nonequilibrium conditions as a result of dissociative excitation of the molecule by electron impact. It has been established that the degree of decomposition of carbon dioxide α and the energy efficiency of the device η do not exceed $\alpha \leq 70$ % and $\eta \leq 23$ %, respectively. These parameters depend on the geometry of the discharge, on the power deposited in the discharge, on the gas flow rate, and on the gap between the electrodes. One of the promising ways to increase the barrier discharge efficiency is to fill the gap between the electrodes with granules of various materials, including catalysts.

Keywords: barrier discharge, carbon dioxide, decomposition, plasma catalysis.

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