

Abstract Submitted
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Dissociation of carbon-dioxide at high-pressure using nanosecond-pulsed dielectric barrier discharges TAEMIN YONG, MARK CAPPELLI, Stanford University — This study investigates the efficiency of the conversion of CO₂ into CO and O₂ using nanosecond repetitively pulsed discharges in a high pressure reactor capable of exceeding the supercritical point. The electrode configuration consists of a pin-to-plane geometry with the plane electrode covered by dielectric material (SiO₂). The products of CO₂ splitting are measured using mass spectrometry. The energy efficiency is determined for a range of residence times, pulse frequency and energy, and reactor pressures. The extent of CO₂ conversion is found to be dependent on the duration of the processing time, reaching an equilibrium level that is linearly-dependent on the discharge pulse energy. The results are compared with our previous experiment conducted in the absence of the dielectric layer.

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