Supporting Information for

Dry Reforming in a Dielectric Barrier Discharge Reactor with Non-uniform Discharge Gap: Effects of Metal Rings on the Discharge Behavior and Performance

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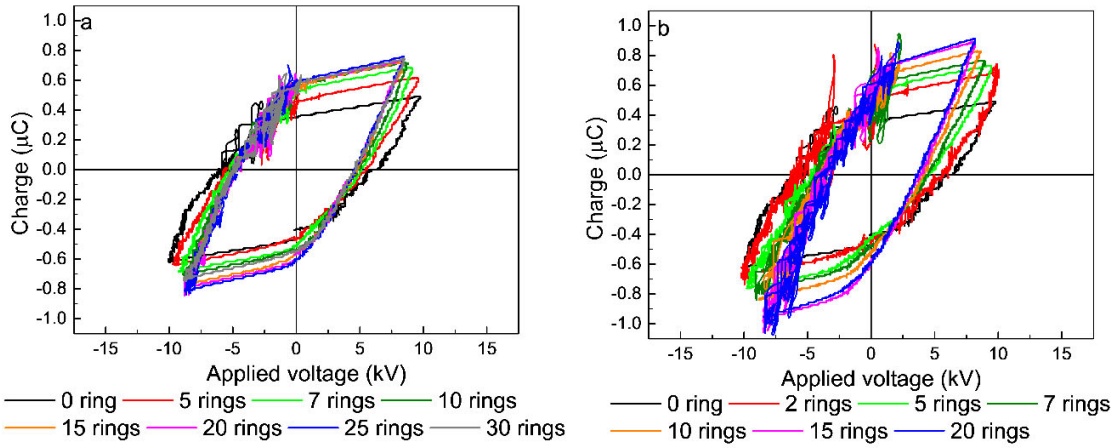

Fig. S1. The raw data of Lissajous figures for plasma-based dry reforming at 50 W supplied power, in a DBD reactor with varying number of stainless steel rings with cross-sectional diameters of (a) 1.6 mm and (b) 3.2 mm.

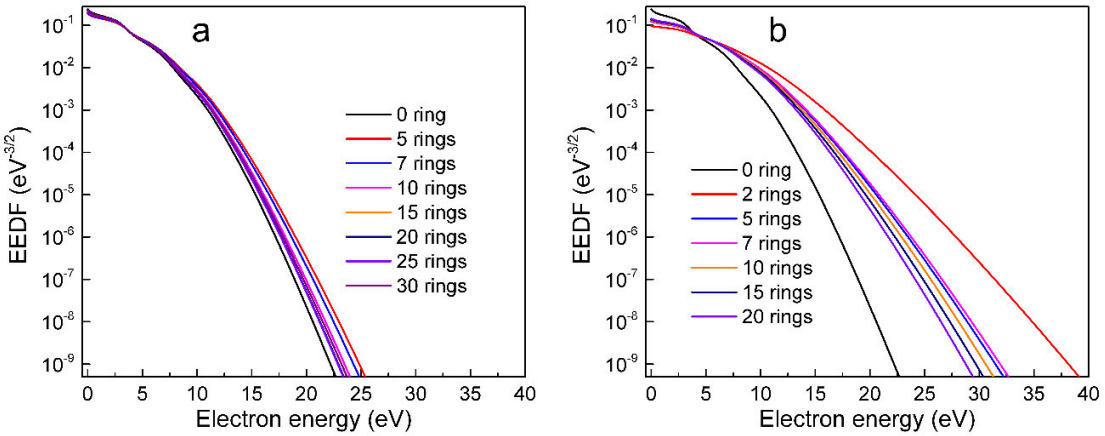

Fig. S2. Calculated electron energy distribution function (EEDF) for plasma-based dry reforming at 50 W supplied power, in a DBD reactor with varying number of stainless steel rings with cross-sectional diameters of (a) 1.6 mm and (b) 3.2 mm.

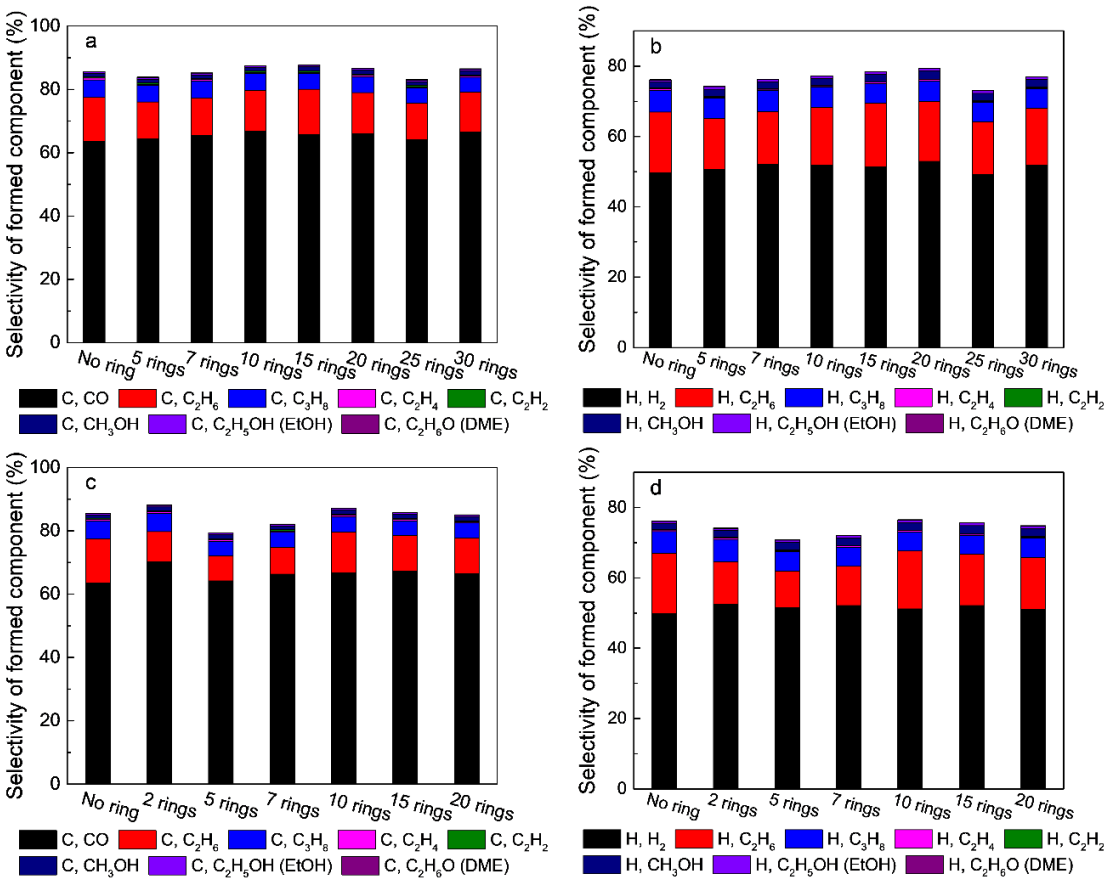

Fig. S3. (a) Carbon and (b) hydrogen atomic balance of plasma-based dry reforming in DBD reactors without rings, and with a varying number of rings with a diameter of 1.6 mm. (c) Carbon and (d) hydrogen atomic balance of plasma-based dry reforming in DBD reactors without rings and with a varying number of rings with a diameter of 3.2 mm. The plasma-based dry reforming was operated at 50 W supplied power.

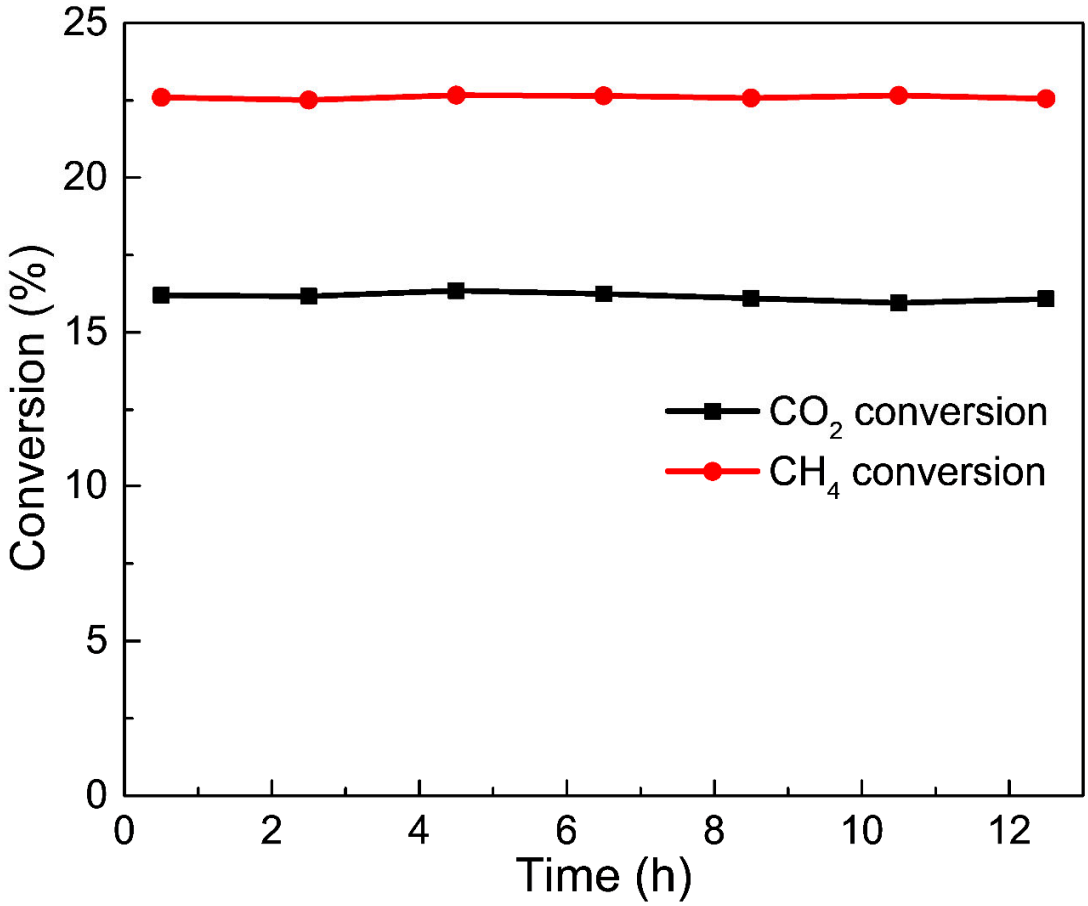

Fig. S4. Conversion of CO_2 and CH_4 in a dry reforming test at 30 W for a 12 hour duration in the DBD reactor with 20 rings with a diameter of 3.2 mm.

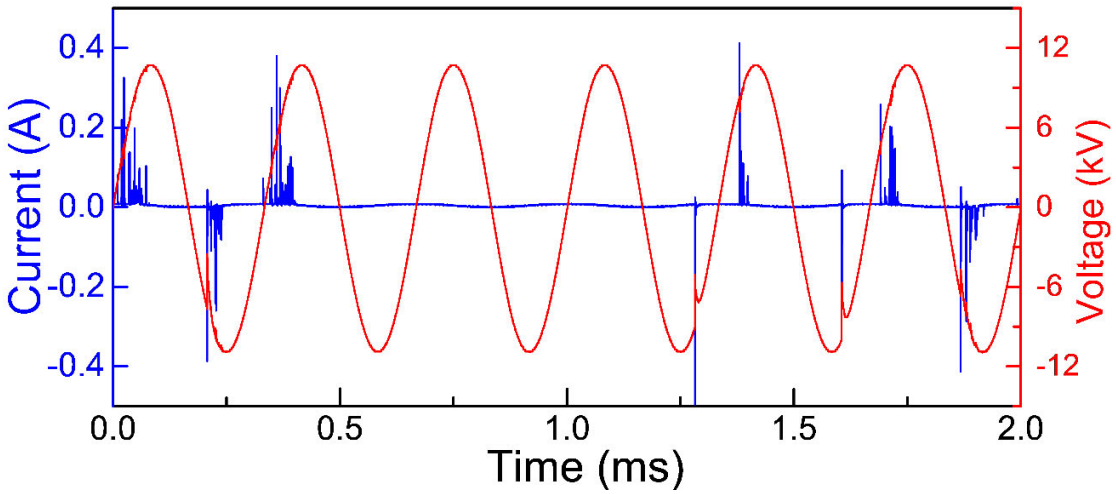

Fig. S5. Current and voltage profile in 2 ms for the reactor with no rings at 30 W supplied power.

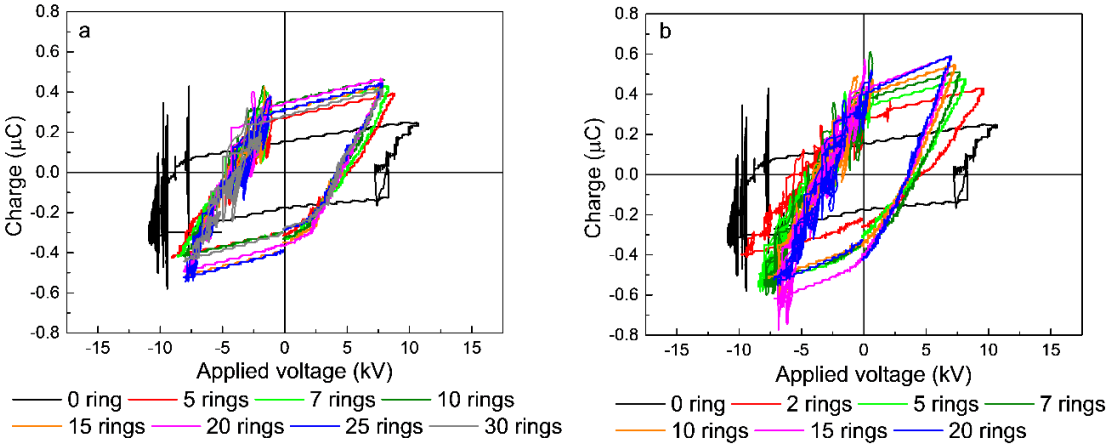

Fig. S6. The raw data of Lissajous figures for plasma-based dry reforming at 30 W supplied power, in a DBD reactor with varying number of stainless steel rings with cross-sectional diameters of (a) 1.6 mm and (b) 3.2 mm.

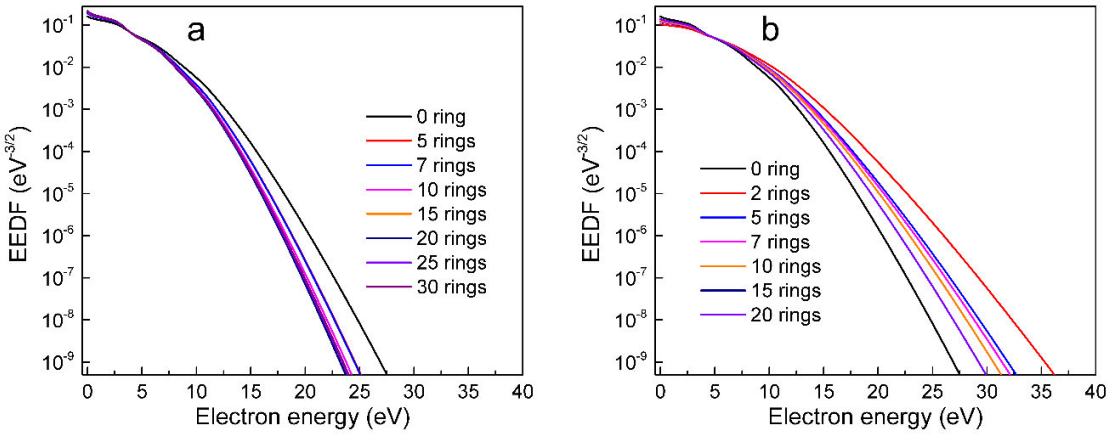

Fig. S7. Calculated electron energy distribution function (EEDF) for plasma-based dry reforming at 30 W supplied power, in a DBD reactor with varying number of stainless steel rings with cross-sectional diameters of (a) 1.6 mm and (b) 3.2 mm.

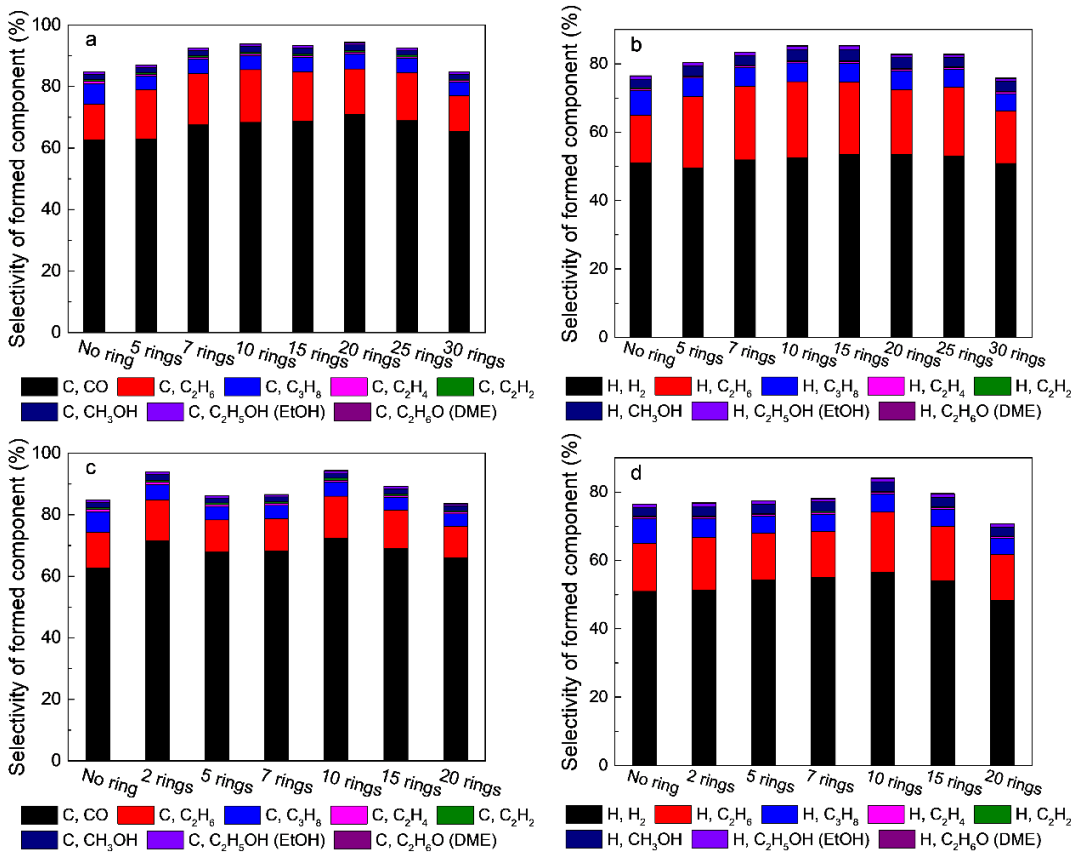

Fig. S8. (a) Carbon and (b) hydrogen atomic balance of plasma-based dry reforming in DBD reactors without rings and with a varying number of rings with a diameter of 1.6 mm. (c) Carbon and (d) hydrogen atomic balance of plasma-based dry reforming in DBD reactors without rings and with a varying number of rings with a diameter of 3.2 mm. The plasma-based dry reforming was operated at 30 W supplied power.

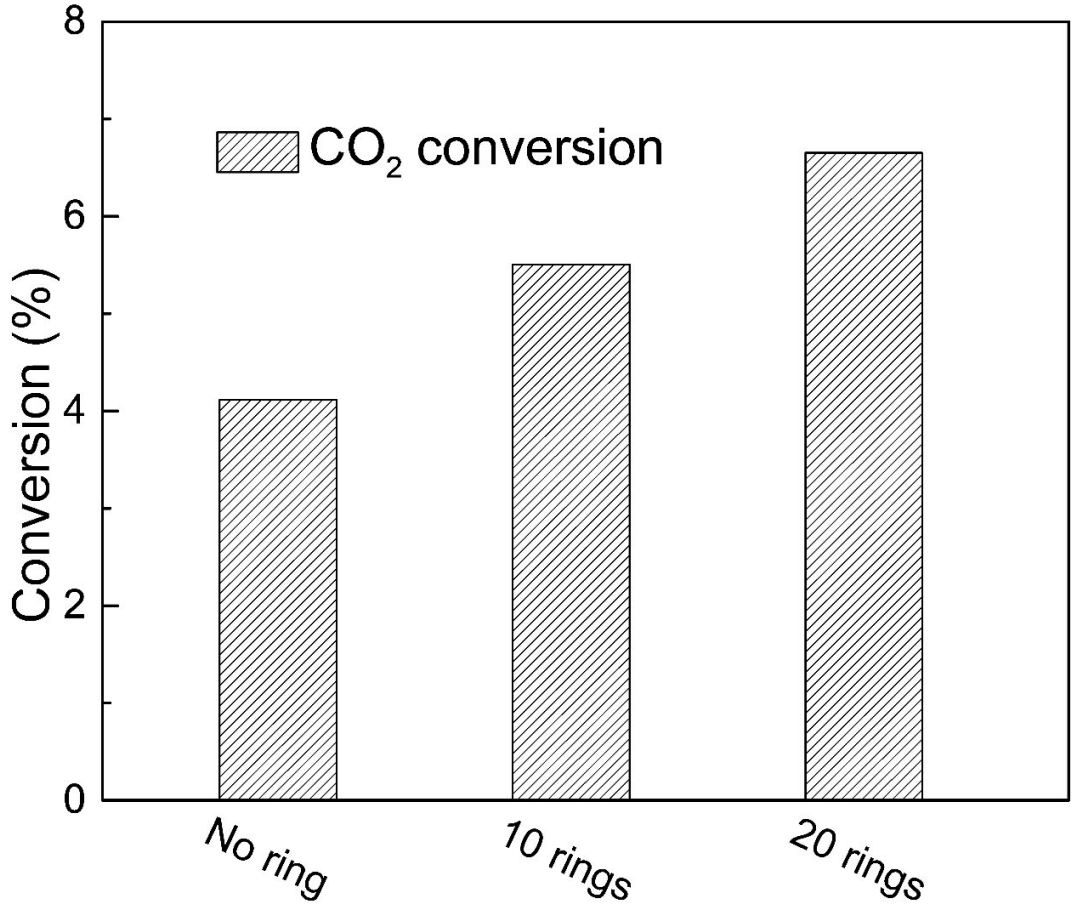

Fig. S9. Conversion of CO_2 in CO_2 decomposition in the DBD reactor at 30 W with rings with a diameter of 3.2 mm.