

Effects of mesoporous graphitic carbon nitride on methane coupling in a dielectric barrier discharge (DBD) plasma-bed

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Mesoporous graphitic carbon nitride (g-C<sub>3</sub>N<sub>4</sub>) was synthesized by using SBA-15 as a hard template. The ordered mesoporous silica SBA-15 was impregnated with carbon nitride precursor (cyanamide) solution. The network of g-C<sub>3</sub>N<sub>4</sub> was formed during calcination. The resulting powder was treated with ammonium hydrogen difluoride solution to remove silica template. The mesoporous structure of g-C<sub>3</sub>N<sub>4</sub> was confirmed via nitrogen physisorption and TEM imaging analyses. The crystallinity of g-C<sub>3</sub>N<sub>4</sub> was observed by wide-angle X-ray diffraction method. The formation of g-C<sub>3</sub>N<sub>4</sub> network was clearly observed in FT-IR spectrum. For further investigation of the effects of graphitic carbon nitride on methane coupling in a DBD plasma-bed, mesoporous g-C<sub>3</sub>N<sub>4</sub> was compared with a SBA-15.