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【602】 Influence of the tungsten surface chemical state on the ammonia formation using low-pressure N₂-H₂ plasmas

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In this contribution, we discuss the catalytic formation of NH₃ using radiofrequency (RF) N₂-H₂ plasmas and a tungsten (W) foil. A parametric study was done at various RF powers (30–300 W), discharge pressures (2–5 Pa), gas compositions (10–90% N₂) and discharge temperatures (< 673 K). NH₃ generally increased with the electron density and/or electron temperature, whereas the discharge temperature had a minor effect. We observed no impact on NH₃ after contaminating the W surface with H₂, N₂ and O₂. Instead, coating the W foil with a nm-thick boron layer led to a reduction of ammonia by half, possibly due to the formation of B-H bonds.

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