**Electrochemical Nitrogen Reduction Reaction on Two-Dimensional Antimonene Nanosheets for Ammonia Synthesis**

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Designing efficient and stable catalysts for the nitrogen (N2) reduction reaction (NRR) based ammonia (NH3) synthesis has been the subject of intense investigation. Herein, we prepared ultrathin two-dimensional (2D) antimonene nanosheets using a combination of ball milling and sonication-based liquid exfoliation method and used them as noble-metal-free electrocatalyst for NRR for the first time. Our 2D antimonene nanosheets without any supporting catalyst exhibit an impressive activity and excellent stability for efficient electrocatalytic conversion of N2 to NH3. At a potential of +0.05 V versus the reversible hydrogen electrode (RHE), a high NH3 yield of ⁓294.9 μg h-1 mg-1CAT) and Faradaic efficiency (FE) of ⁓25.5 % is achieved under ambient conditions using the 2D antimonene. This work opens up a new avenue towards the development of 2D electrocatalysts.



Figure. HAADF and elemental (Sb and O) mapping of antimonene nanosheets.

**References**

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