Ultrathin MoS₂ Nanosheets for Electrocatalytic N₂-To-NH₃ Fixation Under Ambient Conditions

Yanmei Liao, Weijun Ye, Yinghong Zhu*, Lianbang Wang*

College of chemical Engineering, Zhejiang University of Technology, Hangzhou, 310023 Zhejiang China

*E-mail: yhzhuchem@zjut.edu.cn, wanglb99@zjut.edu.cn

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Electrochemical N₂ reduction reaction (NRR) provides a quite potential method for ammonia (NH₃) synthesis under ambient conditions, while it requires efficient and durable catalysts. In this communication, we report an ultrathin nanosheets MoS₂ that acts as electrocatalyst for NRR, which assumed excellent selectivity. In 0.1 M Na₂SO₄ with N₂-saturation under ambient conditions, this electrocatalyst at -0.6 V vs. reversible hydrogen electrode (RHE) exhibited a large NH₃ yield of 41.66 µg h⁻¹ mg⁻¹_{cat.} and a Faradaic efficiency (FE) of 1.10%. Furthermore, the electrochemical stability is also exhibiting excellent.

Keywords: N₂ reduction reaction (NRR); ammonia; MoS₂; selectivity; stability.

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