

### Enhanced ammonia adsorption capacity on magnesium-impregnated MIL-101(Cr)

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Haber-Bosch process produces commercial ammonia, based on iron catalyst and requires high purity of nitrogen and hydrogen to react at high temperature and pressure. This process have drawbacks of reacting at harsh conditions and producing gases causes global warming. It is necessary to develop an economical and environmentally friendly process. The electrochemical ammonia synthesis has been studied recently, and ammonia can be synthesized in a nitrogen atmosphere by using water at normal pressure and relatively low temperature. However, this process produces highly diluted ammonia. Nevertheless, further purification may bring a way for commercialization of this process. Thus, development of an adsorbent for ammonia enrichment could be a feasible option. In this study, MIL-101(Cr, Mg) were used as adsorbents, prepared using Mg precursor in MIL-101(Cr). The content of Mg was impregnated at 0.5–3.0 mmol and the properties according to contents were analyzed by TGA, BET, XRD, SEM, and NH<sub>3</sub>-TPD. Adsorption and desorption of ammonia were carried out through the breakthrough experiments.