

Recent Progress on Industrial Ammonia Synthesis and Separation

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ABSTRACT

The annual NH₃ production is approximately 200 Mt, making it the third-most energy-consuming industry globally. It accounts for nearly 2% of global energy consumption and contributes to 1.3% of global CO₂ emissions. Innovative solutions that can reduce energy intense and CO₂ emission of NH₃ industry are crucial to make NH₃ a more sustainable energy carrier and fuel option, in addition to its traditional use as a fertilizer. In this talk, I will discuss current status of NH₃ industry and present our recent studies on Ru-catalyzed ammonia synthesis with promotion effects using experimental and computational methods at the molecular scale, evaluation of NH₃ cracking to produce H₂ with a low carbon footprint using engineering methods, and application of small-pore metal-organic frameworks (MOFs) as potential porous materials for NH₃ capture, either for energy purposes or for the treatment of environmental pollutants, using experimental and simulation methods [1-4].

References

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