学术报告

题　　目：H_2 production from hydrolysis of ammonia borane: the effect of Ni particle size, carbon support, alloying with Cu, and SiO_2 support size

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报告人简介：郁志新，1998年在中国科学技术大学获学士学位，2001年在瑞典林克平大学获硕士学位，2005年在挪威科技大学获博士学位。先后在挪威科技大学、SINTEF及斯塔万格国际研究所工作，于2013年任挪威斯塔万格大学全职教授，并担任挪威国家石油公司研究中心的首席研究员。主要研究领域包括用于石油和清洁能源生产的纳米材料和纳米技术、纳米催化、合成气和氢气生产、沼气生产、二氧化碳转化和利用等。

报告摘要：The catalytic dehydrogenation of ammonia borane (AB) represents a promising way for hydrogen production. Considerable efforts have been made to the development of active and durable non-noble metal-based catalysts. In this study, Ni nanoparticles (NPs) with controlled sizes in the range of 4.9−27.4 nm are synthesized by tuning the ratio of the nickel acetylacetonate precursor and trioctylphosphine in the presence of oleylamine. These Ni NPs are effective in the dehydrogenation of AB, and their catalytic activities are size-dependent.

Three carbon supports are thus used to disperse and stabilize the Ni NPs. It shows that 8.9 nm Ni NPs supported on Ketjenblack (KB) exhibit higher activity than that supported on carbon nanotubes and graphene nanoplatelets. We then synthesized monodispersed NiCu bimetallic nanoparticles (NPs) with different Ni/Cu ratios of Ni and Cu acetylacetonate precursors. The catalytic activities of bimetallic NPs are found to be also composition-dependent, and are all improved compared with their monometallic counterparts.