

Supporting Information

Catalytic hydrolysis of ammonia borane by cobalt nickel nanoparticles supported on reduced graphene oxide for hydrogen generation

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Chemicals

Ammonia borane (NH₃BH₃, AB, Aldrich, 90%), Cobalt chloride hexahydrate (CoCl₂·6H₂O, Sinopharm Chemical Reagent Co., Ltd., ≥99%), Nickel chloride hexahydrate (NiCl₂·6H₂O, Sinopharm Chemical Reagent Co., Ltd., ≥90%), potassium permanganate (KMnO₄, Sinopharm Chemical Reagent Co., Ltd., ≥99%), hydrogen peroxide (H₂O₂, Sinopharm Chemical Reagent Co., Ltd., ≥30%), sulfuric acid (H₂SO₄, Sinopharm Chemical Reagent Co., Ltd., 95~98%), hydrochloric acid (HCl, Beijing Chemical Works, 36%~37%), potassium peroxodisulfate (K₂S₂O₈, Beijing Chemical Works, ≥99%), phosphorus pentoxide (P₂O₅, Beijing Chemical Works, ≥99.99%), activated charcoal (Aladin Industrial Co.), graphite powder (Qingdao Huatai Lubricant Sealing S&T Co. Ltd, Qingdao, China, 99.99%) and nylon filter membranes (Aldrich, pore size 0.2 μm). All chemicals were used as obtained. We use ordinary distilled water as the reaction solvent.

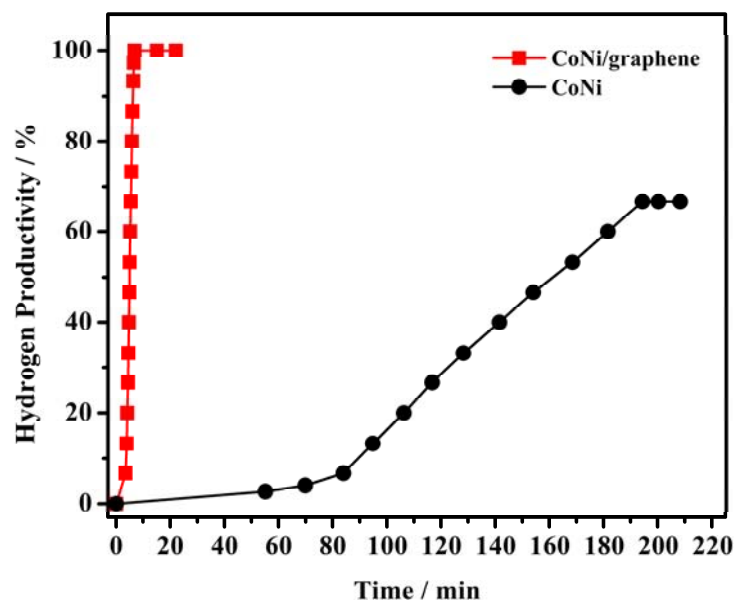


Fig. S1 Hydrogen generation from hydrolysis of ammonia borane (0.10M, 10 mL) catalyzed by CoNi/graphene and CoNi NPs without prereduction.

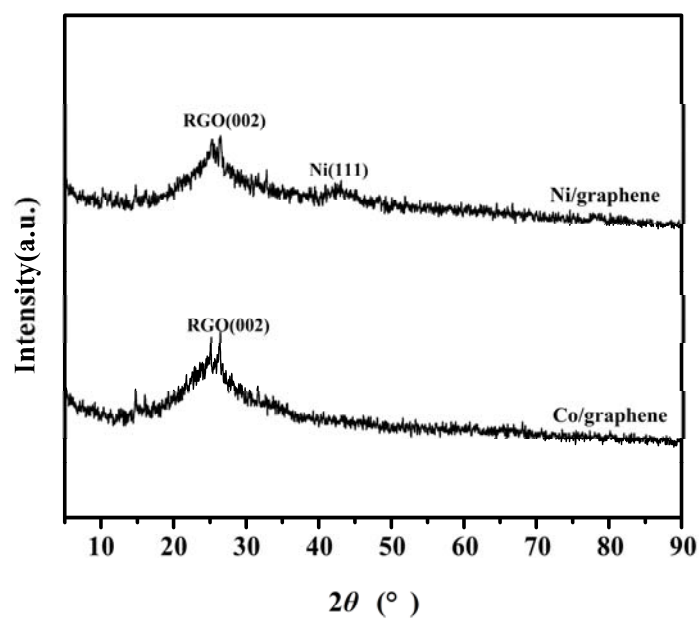


Fig. S2 XRD patterns of Co/RGO and Ni/RGO.

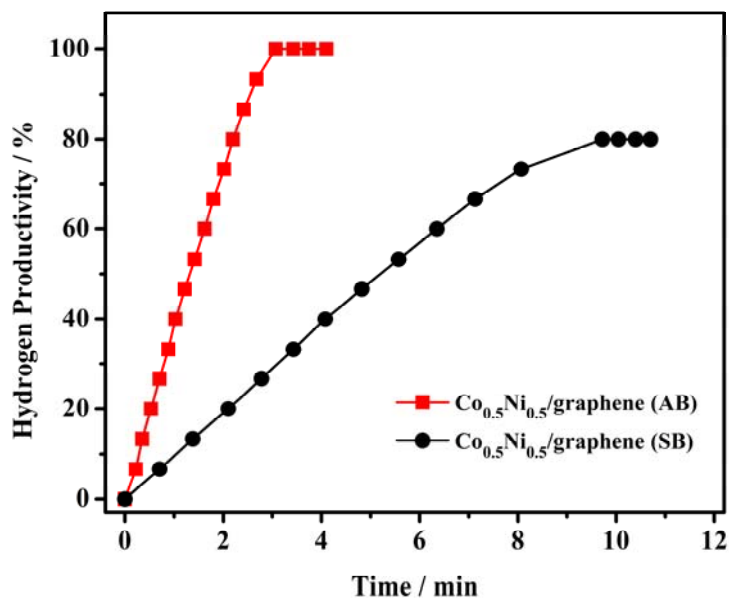


Fig. S3 Hydrogen generation from hydrolysis of ammonia borane (0.10M, 10 mL) catalyzed by Co_{0.5}Ni_{0.5}/RGO reduced by AB and NaBH₄ (SB) respectively. (CoNi/AB = 0.05).

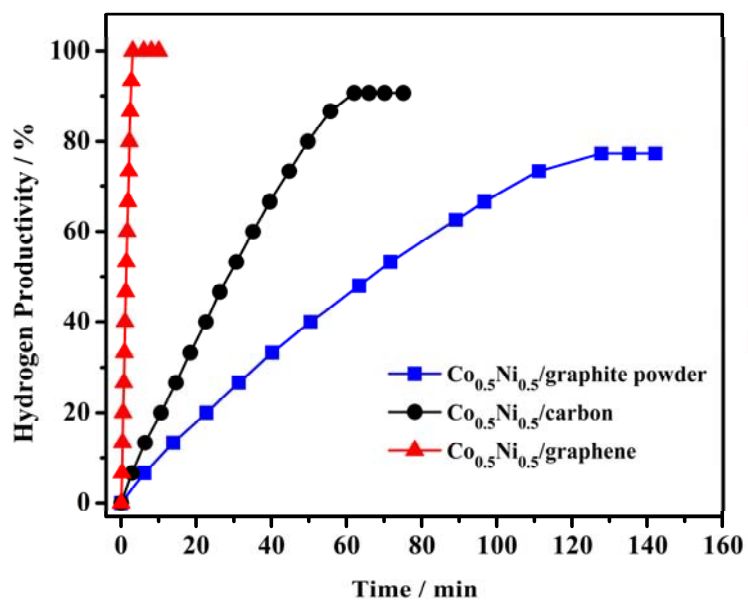


Fig. S4 Hydrogen generation from hydrolysis of ammonia borane (0.10M, 10 mL) catalyzed by Co_{0.5}Ni_{0.5} supported on different carbon materials. (CoNi/AB = 0.05).