

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Enhanced hydrogen storage from nanostructured graphene and nickel hybrids based on spillover mechanism LIN WEI, YUANBING MAO, The University of Texas-Pan American — As a fascinating 2-dimensional carbon material, graphene has been decorated with metal nanoparticles to enhance its hydrogen storage performance based on the spillover mechanism. In this work, Ni and Ni alloys have been used to decorate the surface of graphene. Graphene oxide was fabricated from graphite by improved Hummer method. To form Ni/graphene and Ni/Pd/graphene hybrids, the graphene oxide water dispersion was mixed with nickel chloride (and palladium chloride). Ni(OH)₂/graphene and Ni(OH)₂/Pd(OH)₂/graphene hybrids were synthesized through hydrothermal treatment, using water as a solvent and HMT as a capping agent. After heat treatment and in situ reduction with hydrogen flow, the nanostructured Ni/graphene and Ni/Pd graphene hybrids were obtained. The nanostructured Ni/Pd/Ag/graphene hybrid was synthesized from graphene oxide in the ethylene glycol solution and metal nitrates using similar reactions. XRD, Raman, SEM, AFM were used to characterize these products. ASAP 2020 was used to test the hydrogen adsorption and desorption capacities.

Lin Wei
The University of Texas-Pan American

Date submitted: 14 Nov 2014

Electronic form version 1.4