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Graphene decorated with metal nanoparticles: hydrogen sorption and related artefacts.

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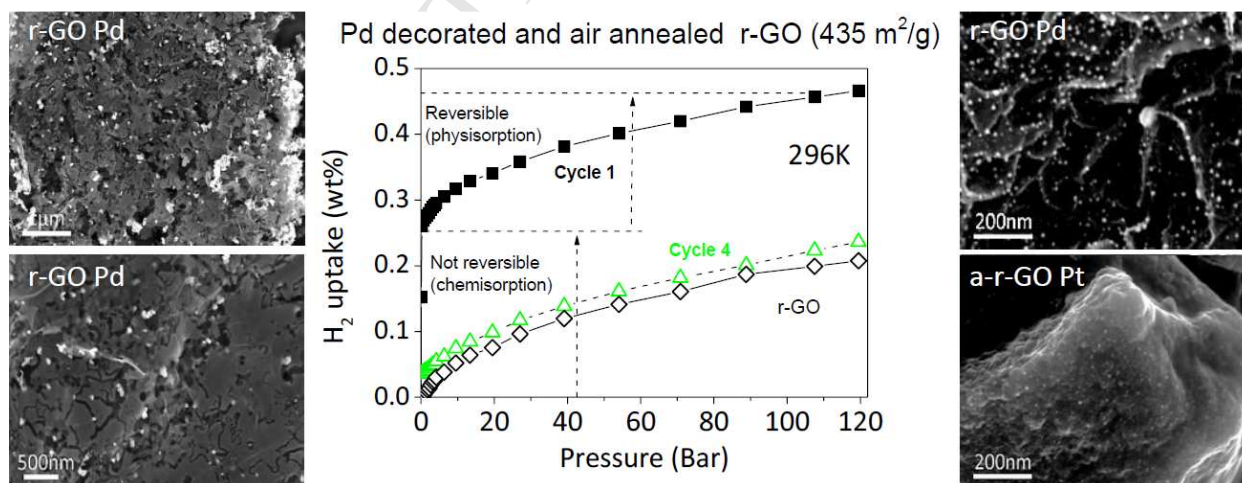
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ABSTRACT

Hydrogen sorption by reduced graphene oxides (r-GO) is not found to increase after decoration with Pd and Pt nanoparticles. Treatments of metal decorated samples using annealing under hydrogen or air were tested as a method to create additional pores by effects of r-GO etching around nanoparticles. Increase of Specific Surface Area (SSA) was observed for some air annealed r-GO samples. However, the same treatments applied to activated r-GO samples with microporous nature and higher surface area result in breakup of structure and dramatic decrease of SSA. Our experiments have not revealed effects which could be attributed to spillover in hydrogen sorption on Pd or Pt decorated graphene. However, we report irreversible chemisorption of hydrogen for some samples which can be mistakenly assigned to spillover if the experiments are incomplete.



KEYWORDS: graphene, hydrogen storage, graphene oxide, nanoparticles, decoration

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