Tata Institute of Fundamental Research
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Internal Webinar

Catalytically and chemically modified reduced graphene oxide composites for energy storage applications

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For successful hydrogen storage, an optimum bonding strength between H_2 gas and the adsorbent is the key parameter. To this end, the synergistic effects of nanostructuring and alloying, their dispersion on graphene(G), hole & electron-doped (boron/nitrogen doped, respectively) graphene have been explored to understand (i) the varying hydrogen bonding strengths and (ii) their effect on subsequent adsorption capacities. Further, the hydrogenated materials have been employed as an active anode material for a Li-ion battery and the resulting positive effects on the specific capacity and stability of the Li-ion battery are demonstrated. The findings of the present work shed light on the development of promising materials with high hydrogen storage capacity at room temperature and moderate pressures of 3 MPa.

In addition, bridging hydrogen storage and Li-ion battery technology, opens up an avenue to cross fertilize interaction between battery and fuel cell research, which have in the past followed parallel directions.

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