

## Some aspects of the graphene-graphane problem

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Some discussion basic and technological (methodological) aspects, or “open questions”, on the graphene/graphane problem [1, 2] have been considered.

It has been shown [3-7] the following:

1. It is expedient to consider graphane (CH) not as a hydrocarbon, but as a carbohydride (the graphene hydride).
2. Graphane can have not only the diamond-like structure, but the graphite-like one, as well.
3. The graphane-like (carbohydride-like) regions can have place in carbonaceous multilayer nanomaterials.
4. The intercalated (“megabar”) hydrogen, with the density up to  $\sim 0.7 \text{ g/cm}^3$ , can be formed (at the expense of the hydrogen association energy) between graphene (graphane) layers in some carbonaceous nanomaterials, under the definite conditions (regimes) of their hydrogenation.
5. It can satisfy the most of the DOE requirements to technologies of the on-board hydrogen storage in fuel-cell-powered vehicles.

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