**On the Electronic and Optical Properties of Fluorographene, Chlorographene, and Graphane**

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**Abstract**

New two-dimensional materials derived from graphene by attachment of hydrogen and halogens have attracted considerable interest over the past few years because of their potential applications (e.g., in electronic devices). [1] Here, we consider presence of point defects and the effect of electron-electron and electron-hole correlation on the electronic/optical properties of materials under study. Especially, large difference between the experimental optical gap and the electronic band gap from many-body GW theory for fluorographene [2,3] was explained by unusual large binding energies of excitons, whereas point defects lowered band gaps and absorption energies only slightly. [4] Similar effects are predicted for chlorographene, which stability is, however, still questionable. [5]

**References**

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**Figure**