

Graphene for a sustainable world

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Beyond the rise and fall of scientific fashion, graphene has genuine optimal properties. For a start, it is an all-surface material (there is no inside), it is impermeable if defect free, it is electrically and thermally conducting and it is mechanically robust relative to its size. Despite being an absorbing material, it is rather transparent because of its atomic thickness. It also has high electronic mobility and low spin-orbit coupling. For these and other reasons, researchers both in the academic and corporate worlds have worked on processing graphene. Graphene is potentially a very sustainable material able to replace metals (heat and electrical transport) indium tin oxide (displays) and if not recycled, simply burned away avoiding hazardous wastes linked to metal disposal. It requires however to be formulated in clean ways, i.e. without potentially harmful solvents and/or surfactants. I will present an update on surfactant free aqueous dispersion of *single layer graphene*, [1] Eau de Graphene (EdG), in which hydroxyl ion adsorption stabilizes graphene sheets in water, [2–4] and on the associated newly created company, Carbon Waters (Figure). [5] Recent works on adapting the EdG strategy to carbon nanotubes, an amazing form of rolled up graphene with actual band gaps (!), will be described if time permits. Finally, starting with a nanocarbon originating from biomethane, [6] we have prepared conducting nanocarbon inks, [6] conductive rubbers, [7,8] nanocarbon/iron nanoparticle composite electrocatalysts, [9] and

microsupercapacitors, all of them might contribute to a cleaner tomorrow. [10]

References

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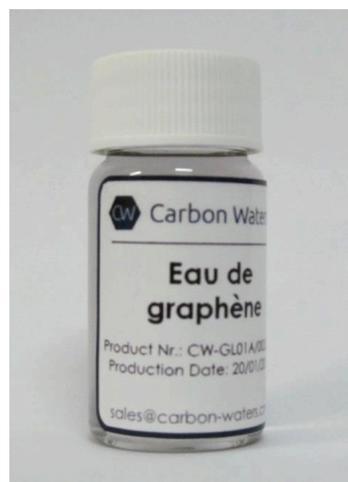


Figure 1: a flask of Eau de Graphene