

Eau de graphène: Endless Horizon of Materials?

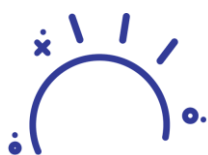
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In recent years, companies producing graphene, have been established all over the world. Common top-down approaches for the large-scale production are centred on the graphene oxide route or the surfactant assisted liquid phase exfoliation.^[1] Depending on the synthesis method, the obtained materials exhibit drastically varying properties regarding the lateral size, number of layers, and amount of defects. However, each of those materials has their advantages and disadvantages and may be suitable for a different type of applications.

Carbon Waters is a CNRS Spin-off based in Bordeaux (France). Our company utilizes a radically different approach to obtain highly exfoliated graphene in aqueous dispersion. By dissolving graphite intercalation compounds in low boiling point aprotic organic solvents, negatively charged graphene (graphenide) flakes in solution can be obtained.^[2] By applying a specific protocol, the transfer of the graphenide solution to water could be achieved.^[3] The resulting dispersion, "Eau de graphène", exhibits exceptional properties compared to other commercially available graphene dispersions. Containing less than 10 layers and an extremely low amount of defects, our material is singled out in particular by the absence of organic solvents and surfactants.



Endless horizons of materials



After 2 years of development and funding from different public organizations in France, the company Carbon Waters was founded in November 2017.

Still being a young company, Carbon Waters focuses its technical development on additives and surface treatments specified to industrial needs. The main focus lies hereby on improving the resistance of materials, e.g. anti-corrosion, thermal management, and metal replacement. To answer the increasing demand, the scale-up of the production process is an integral and high priority of our current work schedule.

Carbon Waters is aiming to find the niche, where "Eau de graphène" can have most effective use and meet the expectation connected to the ongoing search towards the endless horizon of materials.

References

- [1] Kauling, A. P., Seefeldt, A. T., Pisoni, D. P., Pradeep, R. C., Bentini, R., Oliveira, R. V., Castro Neto, A. H, *Advanced Materials*, 30 (2018), 1803784
- [2] Catheline, A., Ortolani, L., Morandi, V., Melle-Franco, M., Drummond, C., Zakri, C., Pénicaud, A., *Soft Matter*, 30 (2012), 7882
- [3] Bepete, G., Anglaret, E., Ortolani, L., Morandi, V., Huang, K., Pénicaud, A., Drummond, C., *Nature Chemistry*, 9 (2017), 347