

GRAPHENE PRODUCTION: CANOE'S RESPONSE FOR INDUSTRIAL NEEDS

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Abstract:

Due to the scientific interest for this material, graphene world production is growing fast. Different types of graphene, from monolayer to graphene nano platelet (GNP) are produced with 4 distinct technologies

- Oxidation - Reduction
- CVD
- Liquid phase exfoliation
- Substrate -less plasma CVD gold

Nevertheless, looking at the few finished graphene based products on the market, graphenes marketed as powders or semi-finished products (liquid dispersions or masterbatches) do not fit with the industrial reality. In fact, end users need to make a compromise between the intrinsic properties and the cost of these materials.

CANOE platform, a French center dedicated to nanostructured composites, has chosen to meet the industrial needs by developing a new graphene production approach by catalytic chemical vapor deposition in fluidized bed process. This technology has allowed the production of Few Layers Graphene with properties corresponding to the specifications of the end users: thickness <10 layers, high purity, %O < 1% and low cost.

This production pilot, using bio based raw materials currently has a production capacity of 8 T / year.

The development of this process is now integrated into the French research program "GRAPULE" that integrates 3 end users in the field of printed electronics, industrial coatings and aerospace, 2 academic laboratories specialized in the field of catalysis and liquid dispersions and two technology centers. The project integrates the entire value chain, from FLG production to final demonstrators through the supply of liquid dispersions or masterbatches.

Figures:

