

# Direct Ink Writing of Lignin-Graphene Oxide Ink for 3D Carbon Material Preparation

## Wilfrid Neri

Julien Roman, Vanessa Fiero, Alain Celzard, Ahmed Bentaleb, Isabelle Ly, Jing Zhong, Alain Derré, and Philippe Poulin.

CNRS, Université de Bordeaux, Centre de Recherche Paul Pascal (CRPP), UMR 5031, 33600 Pessac, France

[julien.roman@crpp.cnrs.fr](mailto:julien.roman@crpp.cnrs.fr)  
[philippe.poulin@crpp.cnrs.fr](mailto:philippe.poulin@crpp.cnrs.fr)

Direct Ink Writing (DIW) describes a fabrication method that employs a computer translation stage and ink-deposition nozzle to create 3D materials with controlled architecture and composition [1]. Colloidal gels are excellent candidate materials for DIW of complex 3D structures. Their rheological properties can be tailored to facilitate the flow through nozzle and produce patterned filaments that maintain their shape. Implementing 3D printing technologies such as DIW to process carbon materials is particularly appealing [2]. Unfortunately, carbon materials, unlike polymers and metals, cannot be easily solubilized for processed. DIW of viscoelastic graphene oxide (GO) ink successfully leads to 3D-printed carbonized materials. However, this approach has allowed for the realization of highly porous and mechanically weak graphene aerogels [3]. Our approach involves making denser 3D structures based on printed mixtures of GO and lignin, an abundant bio-derived precursor with a high carbon content [ref].

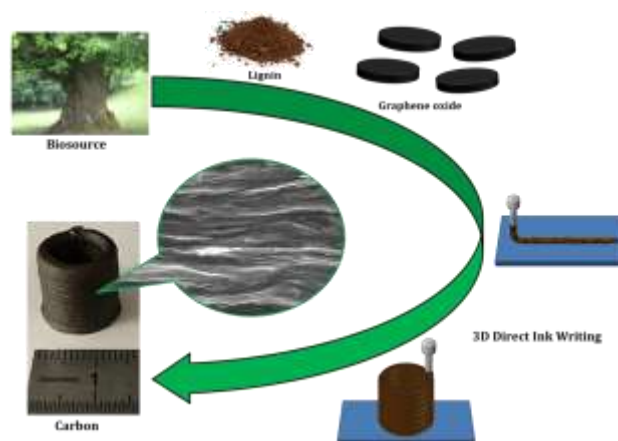
## References

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## Figures



**Figure 1:** Schematic illustration of the fabrication strategy for 3D Printed Carbon materials.