

# Graphene-based dispersions for touch sensor fabrication

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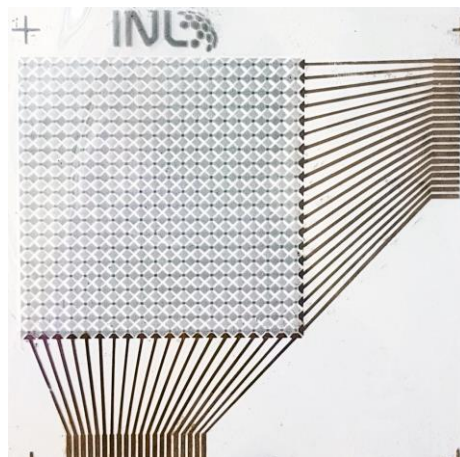
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Graphene-based and two-dimensional materials are approaching the industrial production stage with a sustained pace [1]. These materials can be processed in solution and deposited by several techniques to make components for many technologies, such as flexible electronics [2, 3]. However, graphene-based dispersions are currently rather expensive and face some issues, such as a limited compatibility with substrates or the need for post-processing treatments. Here, we propose an approach to produce graphene-based dispersions with high yield and control on the material properties. Our approach is based on the use of a combination of two solution-processing techniques (*i.e.*, shear mixing and ultra-sonication) for the efficient exfoliation of natural graphite into graphene flakes. The dispersions and the dispersed materials (upon deposition and drying) were carefully characterized by Raman and optical spectroscopy, scanning and transmission electron microscopy, and x-ray photoelectron spectroscopy. The dispersions were deposited by several techniques (*i.e.*, spray coating, inkjet and screen-printing) on various substrates to fabricate films with desired levels of transparency and conductivity. As a proof-of-concept test, we fabricated a capacitive touch sensor by spray coating highly concentrated graphene dispersions in *green* solvents (Figure 1). When interfaced with the electronics and tested, the sensor showed high signal-to-noise ratio and featured multi touch detection.

## REFERENCES

- [1] W. Kong et al., Nature Nanotechnology 14 (2019) 927–938.
- [2] Y. Hernandez et al., Nature Nanotechnology 3 (2008) 563-568.
- [3] A. Capasso et al. Solid State Communications 224 (2015) 53-63.

## FIGURES



**Figure 1:** Graphene-based 10×10 cm<sup>2</sup> touch sensor with external contacts fabricated by spray coating.