



Water-based, defect-free and biocompatible 2D material inks for printed electronics

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Solution processing of 2D materials [1] allows simple and low-cost techniques, such as ink-jet printing, to be used for fabrication of heterostructure-based devices of arbitrary complexity. However, the success of this technology is determined by the nature and quality of the inks used.

Our group has developed highly concentrated, defect-free, printable and water-based 2D crystal formulations, designed to provide optimal film formation for multi-stack fabrication [2]. I will give examples of all-inkjet printed heterostructures, such as large area arrays of photosensors on plastic [2] and capacitors [3] as well as printed transistors on both rigid and flexible substrate [3,4], sensors [5] and memristors [6]. Furthermore, inkjet printing can be easily combined with materials produced by chemical vapour deposition, allowing simple and quick fabrication of complex circuits on paper, such as high-gain inverters, logic gates, and current mirrors [7], compatible with CMOS technology [8].

References

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