Water based and defect-free 2D Inks: from printed electronics to biomedical applications

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In this work we show a general formulation engineering approach to achieve highly concentrated, and inkjet printable water-based 2D crystal formulations, which also provide optimal film formation for multi-stack fabrication (e.g. heterostructures) [1]. Examples of all-inkjet printed devices, such as large area arrays of photosensors on plastic [1], programmable logic memory devices [1], strain sensors on paper [2], capacitors [3] and transistors [3-5] will be discussed.
Furthermore, our approach easily allows tuning of the material's surface chemistry and charge, which determine biocompatibility and cellular uptake [6-8]. In this framework, the cationic graphene dispersions show exceptional biocompatibility, cellular uptake and stability in the biological medium, making this material extremely attractive for further exploitations in the biomedical field [8].

References

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