Graphene technology for future mobile devices

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Due to its various and outstanding peculiar properties, graphene is expected to provide a technological platform which will enable the development of new materials and applications. Therefore, radical advancements and innovations beyond state-of-the-art technologies can easily be envisaged, based on the strong driving force already demonstrated by graphene science in a plenty of R&D fields.

Some main opportunities that could be provided by graphene technology for the development of future mobile devices will be presented, with special emphasis on the applications in energy harvesting and storage.

Indeed, graphene represents an ideal material for the development of portable energy storage devices, thanks to the high specific surface area, the superior electrical conductivity, a high chemical tolerance and a broad electrochemical window. In addition, graphene is a “solution-processable” material, thus allowing the preparation of colloid suspensions suitable for printing applications. Results on functionalized graphene inks [1] and on the realization of graphene-based flexible lithium batteries [2] (see fig.1) will be shown, demonstrating the potential of graphene technology in the field of energy storage.

Moroever, graphene-based transparent electrodes for organic photovoltaic cells, together with the peculiar photo-thermoelectric effect observable in graphene p-n junctions, are likely to provide new opportunities in the realization of energy harvesting devices. Possible perspectives for mobile devices technology within such a field will be illustrated.

Finally, a broader outlook on possible graphene-driven radical innovations in the development of future mobile devices will be given.

References

[1] D. Wei et al.,, Chem. Commun., **48** (2012) 1239.
[2] D. Wei et al., J. Mater. Chem., **21** (2011) 9762.

Figures

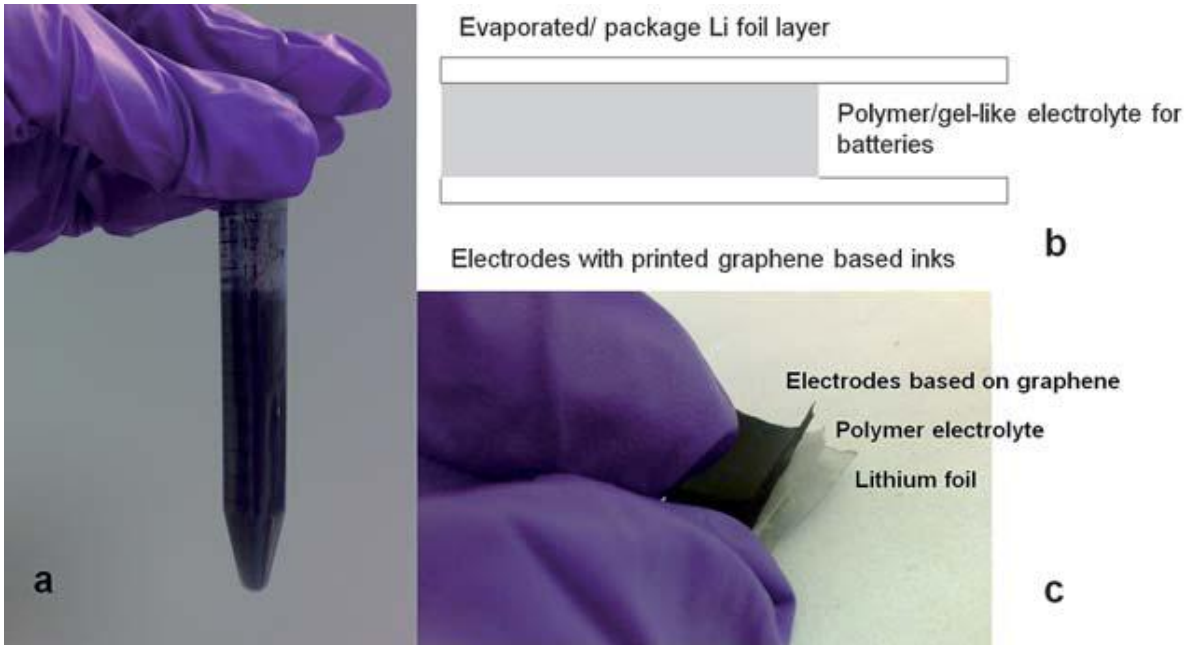

Fig.1 Realization of a lithium battery based on graphene ink cathode and polymer electrolyte (from Ref.[2])