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Aqueous Solar Cells: Novel Trends in Hybrid Devices

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International Conference on Hybrid and Organic Photovoltaics (/hybrid-and-organic-photovoltaics-international-conference)

Proceedings of International Conference on Hybrid and Organic Photovoltaics (HOPV16)

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Organizers: James Durrant, Henry Snaith and David Worsley

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Dye sensitized solar cells (DSSCs) with high performances have been fabricated mainly with organic solvent-based liquid electrolytes. However, these solvents not only have high vapor pressure, but they are often toxic and flammable. In the last few years, the idea of moving towards a water-based or completely aqueous system clearly emerged [1].

DSSCs fabricated with aqueous electrolytes may offer reduced costs, non-flammability and environmental compatibility, but the presence of water in the cell may reduce the long term stability as well as the photovoltaic performance. For this reason, in recent years, an increasing number of research articles has been published in this direction and new dyes, electrodes and electrolyte components are continuously proposed [2].

In this work, the study of different truly aqueous electrolytes is presented and a chemometric approach, useful to investigate and optimize their efficiency and stability, is effectively demonstrated. A few curious and anomalous behaviors observed in the literature and in our laboratories are investigated for this class of electrolytes. Moreover the development of a series of novel aqueous gel electrolytes based on natural polymers is also discussed as well as their interesting photovoltaic characteristics.

[1] Xiang, W.; Huang, F.; Cheng, Y.-B.; Bach, U.; Spiccia, L. *Energy Environ. Sci.*, 2013, 6, 121.

[2] F. Bella, F.; Gerbaldi, C.; Barolo, C.; Grätzel, M. *Chem. Soc. Rev.* 2015, 44 (11), 3431.

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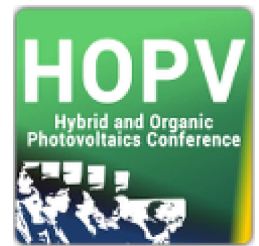
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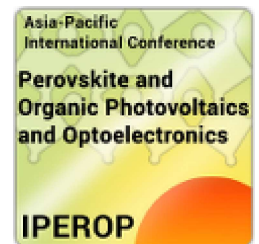
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The International Conference on Perovskite Thin Film Photovoltaics Perovskite Photonics and Optoelectronics (NIPHO) is the best place to hear the latest developments in perovskite solar cells as well as on recent advances in the fields of perovskite light-emitting diodes, lasers, optical devices, nanophotonics, nonlinear optical properties, colloidal nanostructures, photophysics and light-matter coupling.

