

## An overview of dye-sensitized solar cells, materials and advanced concepts.

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Among photovoltaic technologies, Dye-Sensitized Solar Cells (DSSC)s represent a promising approach in terms of efficiency and production costs. They have already demonstrated power conversion efficiencies (PCEs) over 14%, but more interestingly, these devices can be colourful and semi-transparent. For these reasons, this technology is appealing for use Building-Integrated Photovoltaics (BIPV).<sup>[1]</sup>

In this lecture, we will remind the basic working principles of this technology and the materials commonly employed.

We will present our strategies to prepare innovative organic photosensitizers leading to colourful solar cells and modules combining high efficiency and outstanding stability over several years.<sup>[2-3]</sup>

We will disclose our latest work on photochromic dyes specifically designed for photovoltaics and we will demonstrate that these molecules can be used to develop a new generation of functional solar cells capable to self-adjust their optical transparency and their photovoltaic energy conversion as a function of light intensity.<sup>[4]</sup>

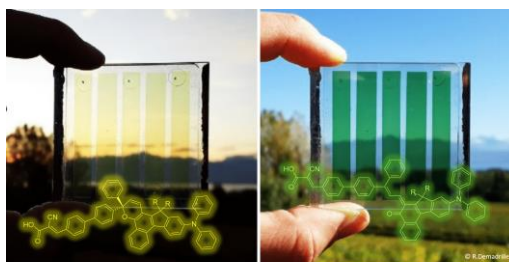


Figure 1: Example of 23cm<sup>2</sup> mini-module based on a photochromic dye under various sunlight conditions (developed in collaboration with Solaronix Company)

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