DEVELOPMENT OF SOLID-STATE DYE-SENSITIZED SOLAR CELLS

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(This Abstract is for a poster presentation to be delivered by Dr Rosie Anthony – r.v.e.anthony@swansea.ac.uk)

Solid-state dye-sensitized cells show great potential in photovoltaics in comparison to liquid dye-sensitized cells, which can suffer from durability problems. It is known that the liquid electrolyte component can corrode electrodes and is prone to leaking from devices. Thus, replacing this with a solid-state hole conductor should lead to increased device stability [1]. Work needs to be done however on developing solid-state technology and increasing their efficiency. Currently, the highest report for liquid dye-sensitized cells is $\eta = 14.7\%$ [2], whilst the highest for solid-state dye-sensitized cells is $\eta = 8\%$ [3].

In this poster, we will present the results of our investigation into increasing efficiency and stability of solid-state dye-sensitized solar cell devices. The focus of the work is to improve light harvesting and charge extraction by testing combinations of dyes and hole transport materials (Figure 1). One such method to improve the solid-state dye-sensitized solar cells is that of co-sensitization using different coloured dyes [4,5].

Figure 1. Different coloured dyes (left) and hole transport materials will be tested in order to maximize efficiency and stability of solid-state dye-sensitized devices (right).

References

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