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ADVANCED ARCHITECTURAL INTEGRATION OF AESTHETIC, ENERGETIC AND RELIABLE FEATURES FOR COLOURED BUILDING INTEGRATED PHOTOVOLTAIC (BIPV) SYSTEMS

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Abstract

Coloured Building Integrated Photovoltaic (BIPV) Systems represent a technically and economically highly efficient technology for use of coloured solar cells within building envelopes to harvest solar energy and produce electrical energy. The first novelty of this review article consisted in the discussion of the two identified advanced types of solar cells, namely: (1) DSSC (dye sensitized solar cells), and (2) STHSC (Si-based tandem heterojunction metal-oxide solar cells) selected for coloured BIPV systems. The correlation between the energetic and aesthetic aspects of these types of solar cells was discussed based on numerical modelling-case study. The second novelty of this review article was represented by a complex approach on reliability analyse that would investigate the studied coloured BIPV systems using their degradation parameters and long-term stability improvement through the encapsulation method, to prevent impurities and humidity**.**
The conclusions of this article highlighted the architectural integration of coloured BIPV systems based on two advanced SCs, namely STHSCs and DSSCs that can be considered as an innovative solution.

Key words: aesthetic-energetic-reliable, architectural integration, coloured BIPV systems, degradation parameters, DSSC, STHSC

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