

Parylene-based Thin-Film Luminescent Solar Concentrators

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Abstract: By depositing Lumogen F Red 305 (LFR305) on different morphologies of Parylene C such as chevronic, columnar, and dense film and studying their optical properties, the main objectives are to improve the performance of Parylene C-based thin-film luminescent solar concentrators (LSCs) by better understanding the relationship between important parameters and the optical and PV behavior of Parylene-C thin-film LSC systems, as well as to offer helpful guidance for a rational approach to thin-film LSC device optimization. The novelty lies in the selection of the luminophore material and the device configuration. The current-voltage (I-V) data is recorded by Keithley 2400 Source Meter under AM 1.5 illumination using a solar simulator. The current of LFR305-doped Parylene C sample is almost 1.5 times larger than glass sample. The current of LFR305-doped Parylene C sample is 1.14, 1.29, and 1.40n times larger than chevronic, dense, and columnar Parylene C sample, respectively. The photoluminescence is measured by FLS1000 Spectrometer showing the peak luminescence happens around 620 nm and 660 nm wavelength.