Editorial

Photovoltaic Materials and Devices

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As the global energy needs grow, there is increasing interest in the generation of electricity by photovoltaics (PVs) devices or solar cells—devices that convert sunlight to electricity. Solar industry has seen an enormous growth during the last decade. The sale of PV modules has exceeded 27 GW in 2011, with significant contributions to the market share from all technologies. While the silicon technology continues to have the dominant share, the other thin film technologies (CdTe, CIGS, a-Si, and organic PV) are experiencing fast growth. Increased production of silicon modules has led to a very rapid reduction in their price and remains as benchmark for other technologies. The PV industry is in full gear to commercialize new automated equipment for solar cell and module production, instrumentation for process monitoring technologies, and for implementation of other cost-reduction approaches, and extensive research continues to be carried out in many laboratories to improve the efficiency of solar cells and modules without increasing the production costs. A large variety of solar cells, which differ in the material systems used, design, PV structure, and even the principle of PV conversion, are designed to date.

This special issue contains peer-reviewed papers in the recent developments in research related to broad spectrum of photovoltaic materials and devices. It contains papers on many aspects of solar cells—the growth and deposition, characterization, and new material development.

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