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Editorial for the Proceedings of the 2016 E-MRS Spring Meeting Symposium T - Advanced materials and characterization techniques for solar cells III

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Abstract

This paper contains the editorial of the proceedings of the 2016 E-MRS spring meeting symposium T on “Advanced materials and characterization techniques for solar cells III”.

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The photovoltaics (PV) industry has seen an unprecedented growth over the last few decades along with a substantial price reduction of PV modules. In the last 5 years only, PV installations across the world have surpassed the total installed capacity from the previous four decades. Nowadays, PV is already inexpensive enough to directly compete with other energy sources especially in sunny locations. Part of the reasons for the cost reduction is the constant improvement of cell and module efficiency for all different PV technologies.

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Silicon has been the dominating material in the PV industry over several decades thanks to its superior properties and the know-how coming from the well-developed silicon microelectronics industry. Recently, very high efficiencies have been reported for solar cells fabricated using various materials such as CdTe, CIGS, perovskites, kesterites, organics, III-V based multi-junction, and thin silicon. One of the most remarkable achievements is the recent increase in efficiency of perovskite solar cells from a few percent to over 20% in just a very short time period of 5 years. Characterization of solar cells and solar materials plays an essential role in these developments. In addition, the development and characterization of earth-abundant, low-cost materials are important to reduce the cost/efficiency ratio further.

The “Advanced Materials and Characterization Techniques for Solar Cells III” symposium provided a forum for scientists, both from academia and industry, to discuss advances in areas of growth, modelling and characterization of solar materials and devices. As a continuation of the previous editions in 2014 and 2012, the symposium aimed at bridging the fundamental knowledge and information obtained from characterization techniques to develop solar cells with high efficiencies at lower costs. More than 230 abstracts, coming from 40 different countries distributed over six different continents, were submitted. A total of 14 invited talks and 56 contributed talks were presented over the course of a week. These talks were organized in 7 different categories, namely: perovskites, advanced characterization, silicon, organic, light management, tandem structures and advanced materials. Moreover, two large afternoon sessions hosted more than 100 poster contributions. The five-day symposium was a real success in terms of attendee participation and scientific excellence, thanks to the work of the scientific committee members, the session chairmen and the symposium assistants. Financial support to the symposium by VAKSIS (Turkey) and GÜNAM (Turkey) is acknowledged and greatly appreciated.

This special issue of Energy Procedia contains 20 selected papers as the proceedings of the “Advanced Materials and Characterization Techniques for Solar Cells III” symposium of 2016.