

## Abstract of Keynote Speech – II

**Nanostructured Solar Cells: Problem of Hole Collector Materials**

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Dye-sensitized solid-state and perovskite solar cells are heterojunctions of the configuration n-type-semiconductor/light absorber/p-type semiconductor, where the optical transparency of both nanostructured semiconductor films, ensure optimum light harvesting. Generally one film (in most cases, the n-type substrate made of an oxide semiconductor) is designed nanostructured, so that the sandwiched light absorber layer acquire a high folded surface area, optimizing the light absorption cross-section. In the ideal situation, the hole collector subsequently deposited, acquire similar nanostructure maintaining a perfect physical contact. However, in reality, it is hard to achieve a perfect contact and even if such a contact is made, it may not establish the necessary electronic coupling- enabling hole transfer- directly or via exciton decomposition. Low efficiency and instability of thin absorber solar cells owes much to the nature of the absorber/hole-collector junction. Fundamental and practical issues related to use of hole collector materials in heterojunction devices will be discussed.