**Link:** <https://solar-power-tech.com/e-posters/psc_eposter_12/>

**Abstract**

Nowadays perovskite solar cells (PSCs) have become significant topic as a source of renewable and stabile energy due to their actual ability to convert solar energy into electricity with high efficiency. In the last decennary, great advances have been made in improvement of PSCs, although the investigation is still in progress [1]. Solar energy is one of the most important and environmentally friendly energy source [2]. Thus, the research and development of high-efficiency and low-cost solar cells is very important objective, especially considering successful commercialization of the conventional crystalline silicon-based solar cells despite their considerable disadvantages [3]. In recent years, development of new efficient organic hole-transporting materials (HTMs) play the key role for the improvement of photovoltaic performance and chemical stability of PSCs. Organic HTMs have attracted much attention due to their their adjustable energy levels, simple synthesis, and good film-forming properties [4]. Therefore, the development of dopant-free HTMs is of great significance. The recent progress in dopant-free HTMs, organic small molecules, has been systematically reviewed and summarized. To bring current dopant-free HTMs closer to the ideal ones, detailed solutions for making dopant-free HTMs more efficient, stable, and cost-effective are analyzed and discussed. In this presentation, synthesis and optical, electrochemical, charge-transporting properties of new easily attainable hole-transporting materials based on carbazole, dibenzofuran or dibenzothiophene cores intended for applications in organic light-emitting diodes and perovskite solar cell will be reported.