SIMPLY DESIGNED HOLE TRANSPORTING MATERIALS FOR EFFICIENT PEROVSKITE SOLAR CELLS

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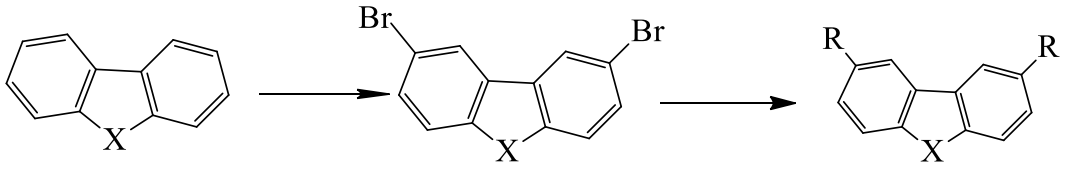
The application of solar cells is one of the most promising solutions for satisfying the ever-increasing global energy demand [1]. Recently, perovskite solar cells (PSC) are gathering attention and have emerged as an extremely promising photovoltaic technology due to their remarkable photovoltaic performance and potentially low production cost [2,3]. Hole- and electron- transporting materials are important constituents of PSCs as they selectively transport charges within the device, influence photovoltaic properties, affect device stability and also influence its cost [4].



X=O,S R=OMe- ,tBu-,(4-MeOPh$_2$)N-

Scheme 1. General structures of the compounds with potential application as HTMs

The aim of this work was the search for new inexpensive and easily synthesizable hole-transporting materials based on carbazole, dibenzofuran or dibenzothiophene heterocyclic core, intended for applications in organic light-emitting diodes and perovskite solar cells. Hole-transporting materials were obtained by two-step synthesis with using of palladium-catalyzed Buchwald-Hartwig reaction. The structures of the obtained compounds were confirmed by NMR spectroscopy (^{1}H, ^{13}C) and mass spectrometry. Additionally, photophysical, electrochemical, thermal properties of all compounds were measured.

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[3]. Yang W S, Noh J H, Jeon N J, et al. High-performance photovoltaic perovskite layers fabricated through intramolecular exchange. Science, 2015, 348(6240): 1234
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