

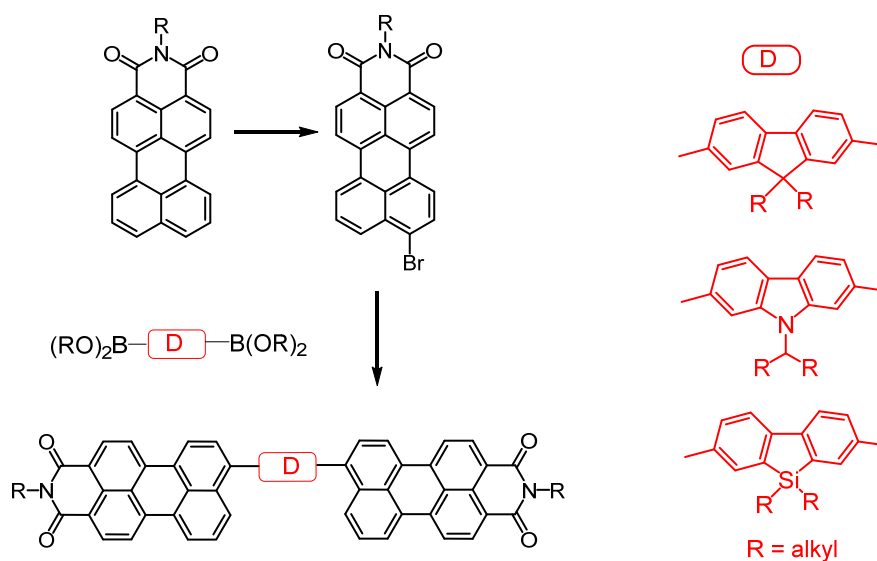
New Non-Fullerene Acceptors for Organic Solar Cells

Stefan Weber, Kathrin Fellner, Matiss Reinfelds, Sandra Steiner, and Gregor Trimmel

Institute for Chemistry and Technology of Materials (ICTM), Graz University of Technology, Stremayrgasse 9, 8010 Graz, Austria

Perylene derivatives are one possible material class that can act as acceptor material in organic solar cells (OSC). In combination with conjugated donor polymers, organic solar cells with efficiencies of approx. 10% can be achieved. Perylenes can be easily functionalized at the ortho- bay- and imide position which offers a variety of different structures to investigate in OSCs.

In this current study two perylene monoimide (PMI) units are synthesized, functionalized and further linked by various aryl diboronic esters such as fluorene, carbazole, silafluorene and others via Suzuki coupling reaction.



The resulting non-fullerene acceptors are simulated by density functional theory (DFT) calculations and compared to the measured optoelectronic properties. Together with suitable donor materials, solar cells are prepared and the influence on concentration, D/A ratio and additives is investigated. Furthermore, the thermal stability as well as lifetime stability is tested and will be discussed.