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Photochemical Synthesis of Aza-aromatic Compounds

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Creation of polyaromatics with unique structural attributes and properties remains in focus of many researchers. Recent literature reveals many examples of exploiting aromatic structures as molecular springs¹, selenoids², tweezers³, motors⁴, dye-sensitized solar cell materials⁵, OLEDs⁶ and sensors⁷. In recent years, the preparation of heteroaromatic species has been studied extensively in order to exploit the unique properties of these molecules. However, aza-aromatic compounds were not elaborated sufficiently and only a few reports have described the synthesis of such compounds despite their possible applications in various branches of chemistry.

Herein we report synthesis of series of novel both aza- and diaza-helicenes, and phenacenes, which were prepared mainly by photocyclization of corresponding imine precursors. Reaction conditions of photocyclization (i.e. solvent, photocatalyst, type of irradiation, use of water scavenger) were optimized and enhanced. Usage of TEMPO as oxidizing agent leads to improvement of yields up to 72 %.

Prepared 2-pyridyl substituted azaphenacenes will be utilized for preparation of potential semiconductive layers in cooperation with Institute of Macromolecular Chemistry of the CAS.

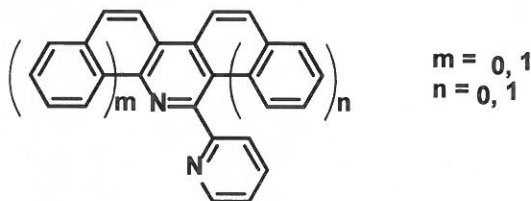


Fig. 1: 2-Pyridyl substituted azaphenacenes

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