

Stereochemistry

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Friedel-crafts reactions of benzylic phosphates: Access to polyarylated alkanes at room temperature

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Polyarylated alkanes have received significant attention as an essential structural motif in the field of pharmaceutical, biological as well as material sciences. One of the major traditional and effective synthetic protocols for polyarylated alkanes includes simple and widely applicable FC type arylation reactions. The potential weaknesses of this approach are related to the reactivity, selectivity, limitation for only electron rich substrates and requirement of hazardous solvents/reagents. Therefore, day-to-day improvement of historically renowned FC reactions has been coming up as an important topic to deal with. In this aspect, both electron-poor/rich primary and secondary benzylic phosphates are conveniently employed to access diversely substituted polyarylated alkanes (diarylmethane/ethane and triarylmethane) with decent selectivity through Friedel-Crafts (FC) type arylation reactions under solvent-free conditions at room temperature (rt) using triflic acid as a catalyst. The potential concerns on synthesis of essentially less accessible polyarylated alkanes with certain electron-withdrawing substituents are addressed by using electron-deficient benzylic phosphates that are abundantly produced from the base mediated reactions of electron-poor aldehydes/ketones with phosphites via favorable phospho-Brook rearrangement. These phosphates react with both activated and deactivated arenes at rt, resulting the desired polyarylated alkanes in good to excellent yield. In case of di- and tri-arylmethanes, desired products were obtained within 2-30 min.

Biography

Manab Chakravarty has completed his PhD from University of Hyderabad and Post-doctoral studies from University of New Mexico. He is the Associate Professor of BITS, Pilani, a premier private academic institute. He has published more than 30 papers in reputed journals and has been serving as a reviewer for various journals.

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