

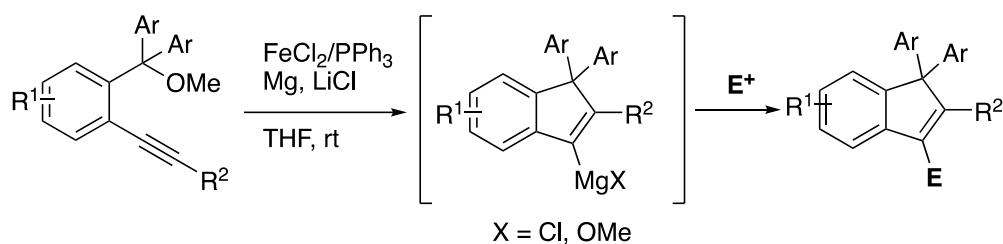
Accessing 1*H*-Indenyl and Dihydro-*s*-Indacenyl Magnesium Reagents via Iron-catalyzed C–O Activation/Acetylenic Cyclization with Magnesium Powder

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Carbon-bridged phenylene vinylene structure, previously reported by our group has found to be applicable in prototype organic photovoltaic device regarding its remarkable photophysical properties and stability.¹ The conventional linear synthesis started from commercially available 1-bromo-2-iodobenzene via 3-lithioindene intermediate using lithium naphthalenide, which guarantees high reactivity while severely limits the substrate scope. Transition-metal catalyzed nucleophilic addition and cross-coupling reactions involving functionalized organometallic reagents are of great importance for carbon–heteroatom or carbon–carbon bond formation in a mild manner².

Here we report a mild and effective synthesis of new indenenes and indacenes via iron-catalyzed C–O activation and acetylenic cyclization. An arylalkyne substrate possessing methoxy group was successfully cyclized via 1*H*-Indenyl and Dihydro-*s*-Indacenyl magnesium intermediate using magnesium as a reductant, lithium chloride as an additive and catalytic amount of iron(II) chloride and triphenylphosphine ligand. A few examples of indenenes trapped with various electrophiles are presented.



1) a). Zhu, X.; Mitsui, C.; Tsuji, H.; Nakamura, E. *J. Am. Chem. Soc.* **2009**, *131*, 13596–13597; b) Zhu, X.; Tsuji, H.; López Navarrete, J. T.; Casado, J.; Nakamura, E. *J. Am. Chem. Soc.*, **2012**, *134*, 19254–19259. 2) Liu, Y.; Wang, L.; Deng, L. *J. Am. Chem. Soc.* **2016**, *138*, 112–115.