**CYCLIC UREAS AS EFFICIENT, SUSTAINABLE LIGANDS IN   
IRON-CATALYZED CROSS-COUPLING OF   
ARYL CHLORIDES AND TOSYLATES**

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Development of new strategies encompassing cross-coupling of unreactive bonds has revolutionized organic synthesis.[1,2] In this context, iron-catalyzed coupling of halides and C–O electrophiles holds a significant potential for widespread green applications due to low price, abundance and virtually lack of toxicity of iron catalysts.[3-5] However, by far the most common ligand in iron-catalyzed cross-couplings for preparative and industrial applications is reprotoxic NMP.

Herein, we report that cyclic ureas (DMI, DMPU) are efficient and sustainable alternatives to NMP in iron catalyzed alkylations of aryl chlorides and tosylates with alkyl Grignard reagents. These environmentally benign methods accomplish traditionally challenging C(sp2)–C(sp3) cross-coupling with organometallics possessing β-hydrogens with efficiency matching or superseding current state-of-the-art. The reactions are compatible with a variety of electrophilic functional handles. Applications to double and site-specific alkylations will be described. Representative examples to be presented include reaction optimization, scope studies and investigation of the mechanism.

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