

## Telluride-Based Pillar[5]arene: A Potent and Recyclable Catalyst for Alkylation Reactions in Water

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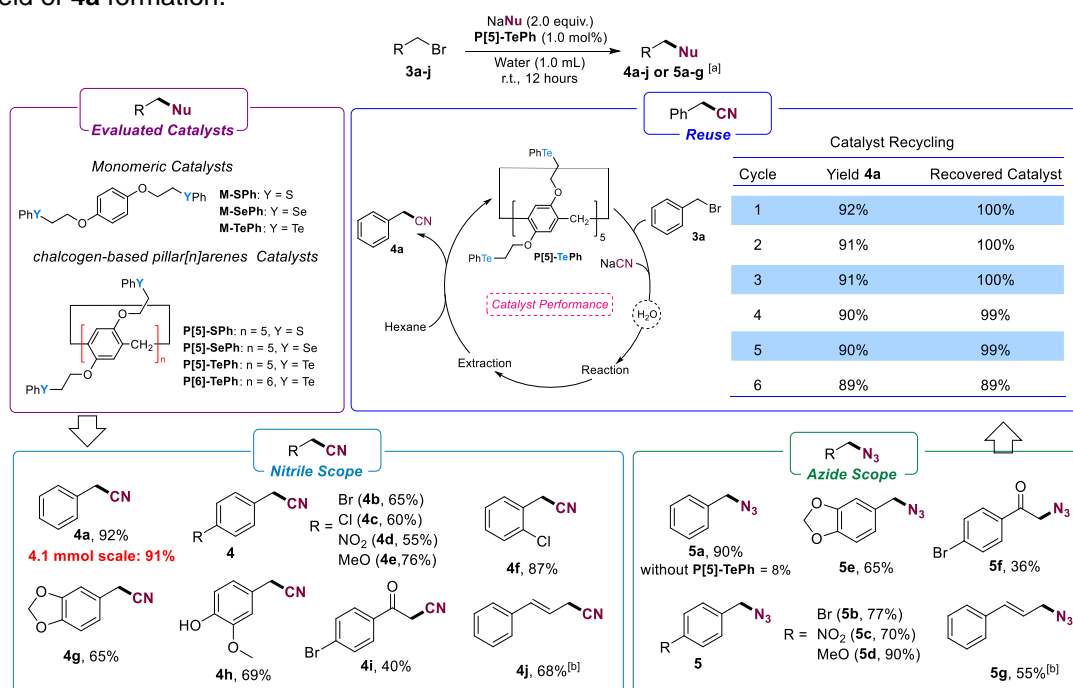
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### ABSTRACT

Pillar[*n*]arenes are a new generation of supramolecular macrocyclic hosts that can form inclusion complexes with small molecules through various interactions like dipole-dipole, hydrogen bonding, and  $\pi$ - $\pi$  stacking.<sup>1</sup> Due to their short discovery time, the chemistry involving these macrocycles is still little explored, especially as catalysts, despite their ability to catalyze efficiently Heck and Suzuki coupling reactions.<sup>2</sup> In this way, we report the synthesis of chalcogen-based pillar[5]arenes, including new sulfide- and telluride-based pillar[*n*]arenes, and their catalytic activity in promoting alkylation of nucleophiles in aqueous solutions. The optimized protocol showed that using 1 mol% of **P[5]-TePh** is enough to convert benzyl bromide into nitriles or azides employing a variety of substrates containing both EWG/EDG groups and alfa-carbonyl moieties (Scheme 1). We also observed that the yield of the conversion of benzyl bromide to **3a** was not affected on a larger scale. Additionally, for our delight, the catalyst could be reused for 5 cycles with excellent recovery and no reduction in the yield of **4a** formation.



Scheme 1.

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