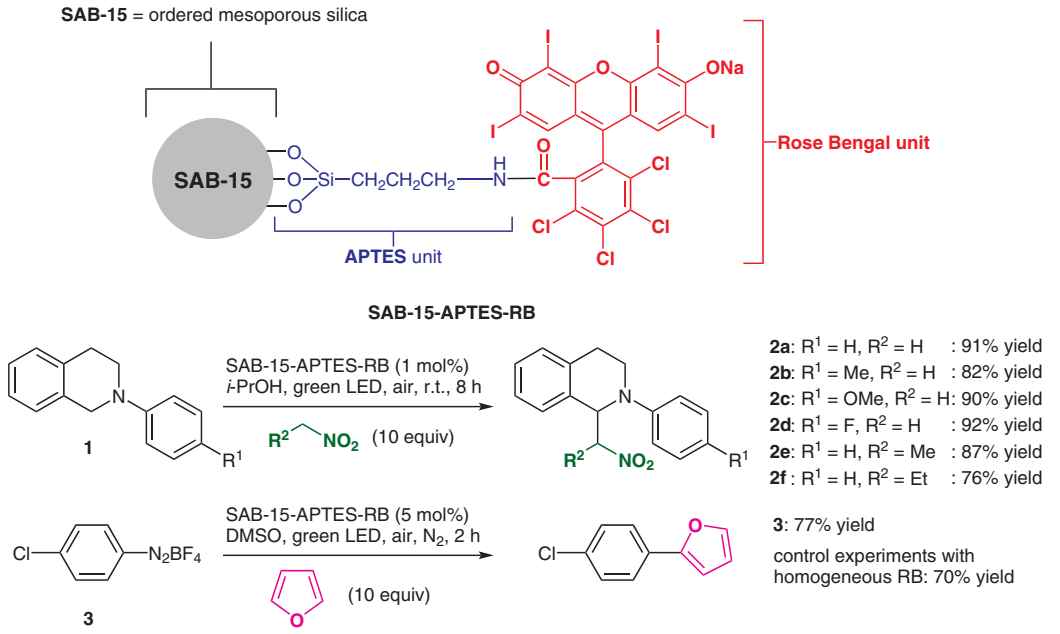
S. M. SORIA-CASTRO, B. LEBEAU, M. CORMIER, S. NEUNLIST, T. J. DAOU*, J.-P. GODDARD*
(UNIVERSITÉ DE HAUTE-ALSACE, MULHOUSE, AND UNIVERSITÉ DE STRASBOURG, FRANCE)

Organic/Inorganic Heterogeneous Silica-Based Photoredox Catalyst for Aza-Henry Reactions
Eur. J. Org. Chem. **2020**, 1572–1578.

SAB-15-Supported Rose Bengal as a Heterogeneous Photoredox Catalyst



Significance: A series of solid-supported dye composites consisting a rose bengal (RB) unit covalently linked to inorganic porous supports (e.g., silica or zeolites) were prepared for use as heterogeneous photoredox catalysts. An ordered mesoporous silica SAB-15-supported RB tethered to a 3-aminopropylsilane moiety (SAB-15-APTES-RB) catalyzed the aza-Henry reaction under green LED irradiation. For example, tetrahydroisoquinoline **1a** reacted with nitromethane in the presence of 1 mol% of SAB-15-APTES-RB at room temperature under LED irradiation to give the aza-Henry adduct **2a** in 91% yield. SAB-15-APTES-RB was also effective for reductive coupling of the aryl diazonium compound **3** with furan, showing a catalytic performance that was comparable to that of its homogeneous counterpart carried out with RB.

Comment: A robust and readily recyclable RB-based photocatalyst for organic synthesis has not been well studied so far, although a similar mesoporous silica-supported RB has been developed as a photosensitizer (C. Mendoza et al. *ChemPhotoChem* **2018**, *2*, 890). SAB-15-APTES-RB was characterized by means of IR, UV/Vis, ^{13}C, and ^{29}Si NMR analyses. In the reaction of **1a** with nitromethane, SAB-15-APTES-RB was recovered and reused for a total of eight runs without significant loss of its catalytic activity, though a slight decrease of activity was observed in the ninth run or later. Molecular oxygen served as the sole oxidant for the aza-Henry reaction, which did not proceed in darkness under otherwise similar conditions.

SYNFACTS Contributors: Yasuhiro Uozumi
Synfacts 2020, 16(06), 0691 Published online: 15.05.2020
DOI: 10.1055/s-0040-1707951; **Reg-No.:** Y04220SF

Category
Polymer-Supported Synthesis

Key words
photoredox reaction
aza-Henry reaction
mesoporous silica
rose bengal