

Catalytic Properties of Photo Lewis Acid Generators Based on Photochromic Terarylene

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Photo Acid Generators, PAGs, generate Brønsted acids upon photo-irradiation, which is widely used in photopolymer systems such as photoresists. We previously reported a series of terarylene-based PAGs which irreversibly release acids with high photochemical quantum yields (over 70%)^[1]. We have also demonstrated quantitative photo-release of triflic acid which can initiate photo-polymerization of epoxy monomers^[2]. However, all previous PAGs have been limited to release Brønsted acid. We recently reported the Photo Lewis Acid Generators (PLAGs, 10) based on a terarylene and examined their reactivity in Lewis acid catalytic reactions including epoxy-polymerization and Mukaiyama aldol reaction^[3]. In the present study, we deliver new derivatives of PLAGs (20, 30, 40) and evaluated their catalytic properties (Figure 1). Compound 20 was designed as a target containing a phenyl ring introduced for simplification of structure within the scaffold of a triflate unit. In addition, 30 and 40 introducing electron deficient pyridine units, which were expected to increase the Lewis acidity. We investigated the capability of 10 and new PLAGs in epoxy- and vinyl ether-polymerization.

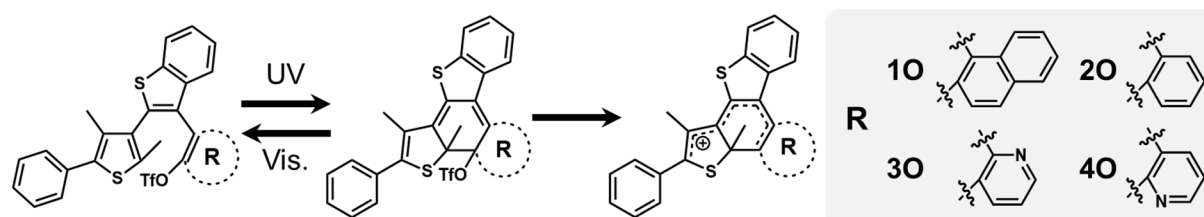


Figure 1. Photo induced Lewis acid generating reaction of PLAGs.

[1] R. Li, T. Nakashima, R. Kanazawa, O. Galangau, T. Kawai, *Chem. - Eur. J.*, **2016**, (22), 16250–16257.

[2] R. Li, T. Nakashima, T. Kawai, *Chem. Commun.*, **2017**, (53), 4339–4341.

[3] R. Mizutsu, R. Asato, C. J. Martin, M. Yamada, Y. Nishikawa, S. Katao, M. Yamada, T. Nakashima, T. Kawai, *J. Am. Chem. Soc.*, **2019**, (141), 20043–20047.