

DIELS-ALDER REACTION OF 1,4-BENZODITHIIN 1,1,4,4-TETRAOXIDE WITH A VARIETY OF DIENOPHILES

Juzo NAKAYAMA, Yoichi NAKAMURA, and Masamatsu HOSHINO

Department of Chemistry, Faculty of Science, Saitama University,
Urawa, Saitama 338, Japan

1,4-Benzo- and 1,4-Naphthoquinones function as typical dienophiles. 1,4-Dithiin and 1,4-benzodithiin 1,1,4,4-tetraoxides (1 and 2) possess an iso-electronic structure with these quinones. However, no reports on Diels-Alder reactions of these sulfones have appeared, although Diels-Alder reaction of phenyl vinyl sulfone (3) and its application to organic synthesis were reported by Paquette et al. We report the synthesis and Diels-Alder reaction of 2.

Sulfone 2 acts as a typical dienophile and reacts with a variety of dienophiles under milder conditions than those reported with 3 to give the corresponding Diels-Alder adducts in nearly quantitative yields. Typical results are summarized in Table.

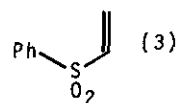
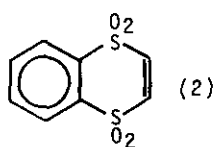
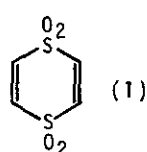


Table Diels-Alder Reaction of 1,4-Benzodithiin 1,1,4,4-Tetraoxide

Dienes	Adducts	Yield (%)	Conditions
		93	reflux, toluene, 1 h
		95	r.t., CH ₂ Cl ₂ , 1 h
		98	r.t., CH ₂ Cl ₂ , 20 h
		95	50 °C, ClCH ₂ CH ₂ Cl, 10 h
		96	50 °C, ClCH ₂ CH ₂ Cl, 10 h
		98	50 °C, ClCH ₂ CH ₂ Cl, 10 h