Use of Acetylene Gas as Dienophile in a Diels–Alder Reaction

Significance: The use of acetylene gas as the dienophile in a cycloaddition Diels–Alder reaction to the bay region of a polycyclic aromatic hydrocarbon is reported for the first time.

Comment: The sequence of cycloaddition followed by hydrogen elimination–rearomatization utilizing acetylene might prove to be a useful tool in the preparation of larger polycyclic aromatic hydrocarbons, such as uniform carbon nanotubes, from small hydrocarbon templates.

E. H. Fort, M. S. Jeffreys, L. T. Scott (Boston College, Chestnut Hill, USA)
Diels–Alder Cycloaddition of Acetylene Gas to a Polycyclic Aromatic Hydrocarbon Bay Region

Mes
Mes
Mes
Mes
Mes
H–C≡C–H (1.8 atm)
DMF, 140 °C, 48 h
21% conversion
Mes
Mes
Δ
H₂ elimination
∆
Diels–Alder cycloaddition
Mes
Mes
Mes
Mes
Mes

SYNFACTS Contributors: Timothy M. Swager, Silvia V. Rocha
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