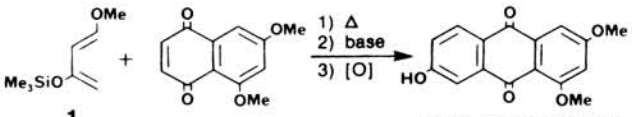
Diels-Alder Chemistry

Novel Applications

The Diels-Alder reaction has become the most widely utilized method for the one-step, stereospecific construction of six-membered ring systems.[1] New uses for both classical and recently developed Diels-Alder reagents are constantly being devised; a sampling of recent literature illustrates the increasing diversity of this valuable synthetic method.

Dienes

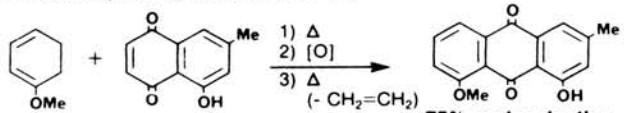
1-Methoxy-3-(trimethylsilyloxy)butadiene (1, "Danishefsky's diene")[2]



1

100% regioselective

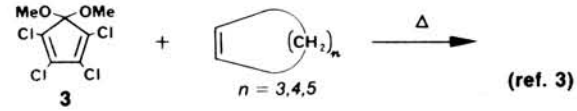
1-Methoxy-1,3-cyclohexadiene (2)[2]



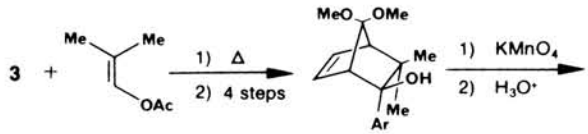
2

75% regioselective

5,5-Dimethoxy-1,2,3,4-tetrachlorocyclopentadiene (3)



(ref. 3)

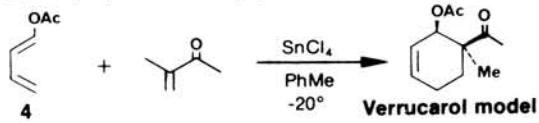


(ref. 4)

Ar = *p*-tolyl

(±)-β-Cuparenone

1-Acetoxy-1,3-butadiene (4)[5]

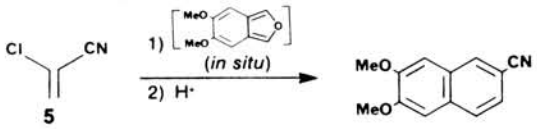


4

Verrucarol model

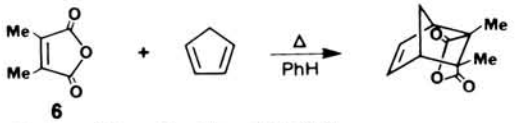
Dienophiles

2-Chloroacrylonitrile (5)[6]



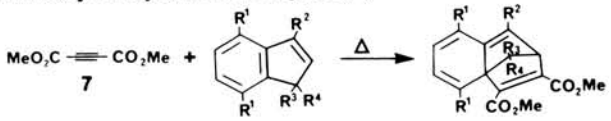
5

2,3-Dimethylmaleic anhydride (6)[7]



6

Dimethyl acetylenedicarboxylate (7)[8]



7

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1) For recent reviews of certain aspects, see J. Sauer and R. Sustmann, *Angew. Chem., Int. Ed. Engl.*, **19**, 779 (1980); T. Wagner-Jauregg, *Synthesis*, 769 (1980).
2) K. Krohn, *Tetrahedron Lett.*, **21**, 3557 (1980).
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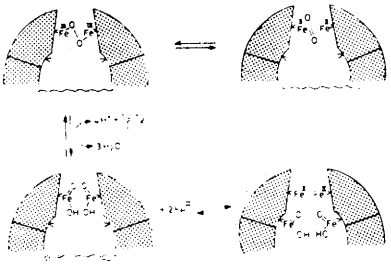

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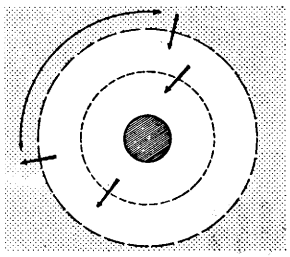

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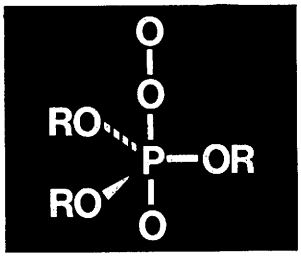

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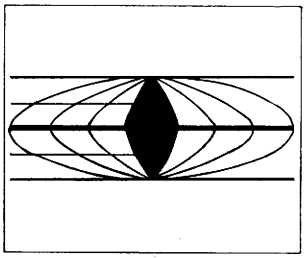

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