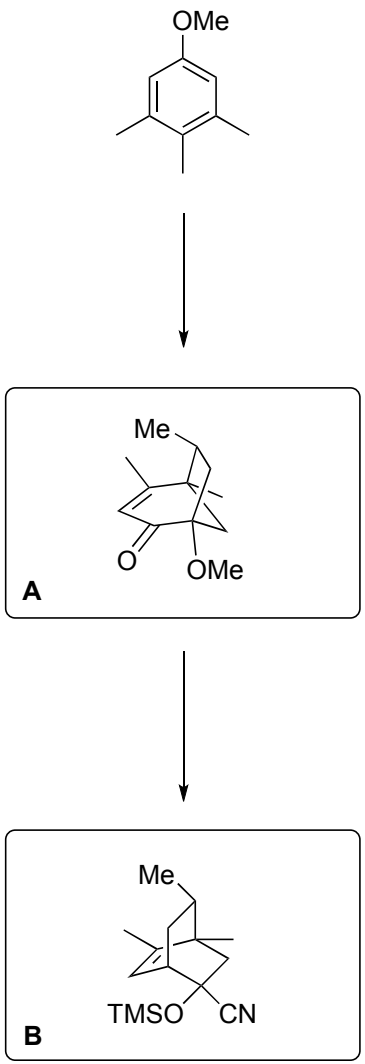
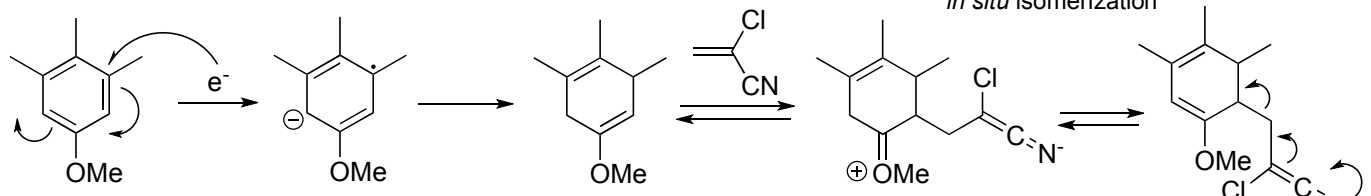
Total Synthesis of (±)-Nakafuran-8

Uyehara, T., Sugimoto, M., Suzuki, I., Yamamoto, Y., *J. Chem. Soc. Chem. Commun.* **1989**, 1841–1842

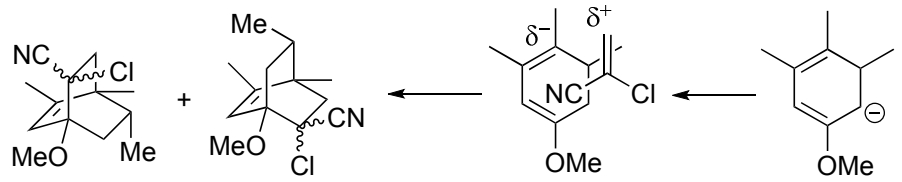


Explain the mechanism of steps 1 and 2



Electrons are kept apart from each other and from oxygen electron density. Most stable radical and anion under this circumstances.

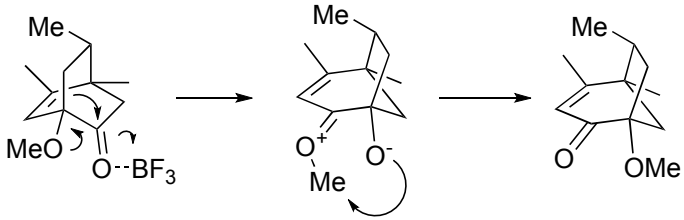
1) NH_3, *t*-BuOH, Li, THF, -78ºC
2) Chloroacrylonitrile, PhH, reflux
3) Na_2S, H_2O/EtOH, reflux
4) BF_3, MeOH



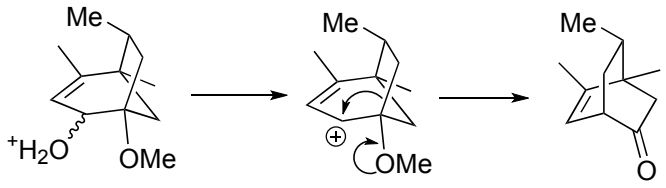
(depending if acrylate above or below in D-A)

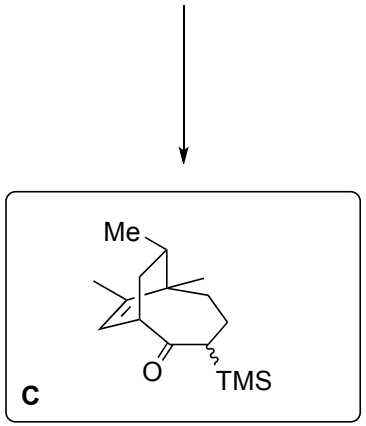
Explain the mechanism of step 4

5) DIBALH
6) PTSA, PhH, reflux
7) TMSCN, ZnI_2



Mechanism for step 6

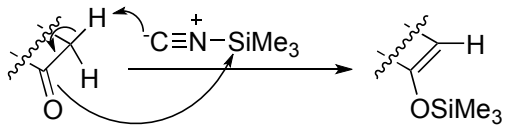


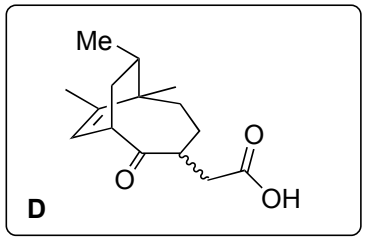


8) $LiAlH_4$
9) $NaNO_2$, AcOH, H_2O
10) $TMSCHN_2$, BF_3•Et_2O

Role of ZnI_2 in step 7

Increases reaction speed by activating ketone, avoids formation of silyl enolate (probably formed by the isocyanate tautomer)

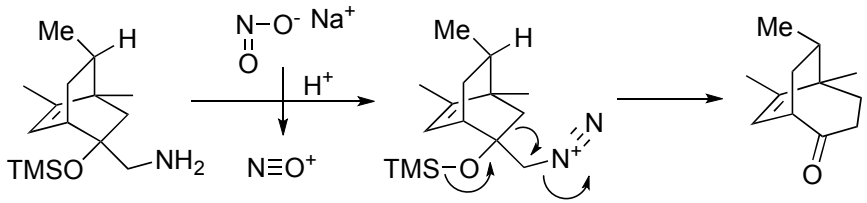




11) K_2CO_3, MeOH/H_2O
12) LDA, HMPA, ICH_2CO_2Et
13) K_2CO_3, MeOH/H_2O

Provide a name and mechanism for step 9

Tiffeneau-Demjanov rearrangement



14) PTSA, PhH, reflux
15) DIBALH
16) H^+