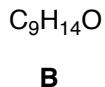
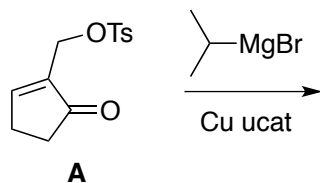


1. (15 points) Deduce the structure of **B**, and draw an arrow-pushing mechanism for its formation.



IR: 2959, 1723, 1634, 1237 cm^{-1}

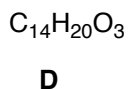
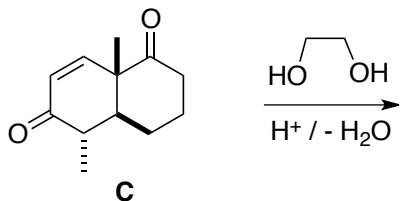
^{13}C NMR

207.9, s
 147.7, s
 117.6, t
 47.2, t
 37.1, d
 30.0, d
 21.2, t
 20.6, q
 17.6, q

1H NMR

6.09, d, $J = 2.9$ Hz, 1H
 5.24, d, $J = 2.9$ Hz, 1H
 2.6, m, 1H
 2.4, m, 2H
 1.9, m, 2H
 1.7, m, 1H
 1.00, d, $J = 6.8$ Hz, 3H
 0.87, d, $J = 6.8$ Hz, 3H

2. (15 points) Deduce the structure of **D**, and draw an arrow-pushing mechanism for its formation.



IR: 1676, 1184, 875 cm^{-1}

^{13}C NMR

201.6, s
 155.5, d
 127.6, d
 111.5, s
 65.3, t
 64.8, t
 45.8, d
 45.3, s
 42.0, d
 29.2, t
 23.8, t
 22.7, t
 16.1, q
 12.4, q

1H NMR

7.01, d, $J = 10.0$ Hz, 1H
 5.87, d, $J = 10.0$ Hz, 1H
 4.0, m, 4H
 2.25, dq, $J = 13.0, 6.5$ Hz, 1H
 2.04, td, $J = 13.0$ Hz, 3.0 Hz, 1H
 1.6, m, 5H
 1.2, m, 1H
 1.16, s, 3H
 1.09, d, $J = 6.5$ Hz, 3H