

Give mechanistic reasoning for the following reactions, justifying any stereochemical outcomes.

1. C1CCC(CC1)C(O)C#CC2=CC=CC=C2 >> [0.05 eq. AgSbF6, DCM, RT] C1CCC2C(C1)OC(=O)C2C3=CC=CC=C3
2. CC1=CN(C)C2=CC=CC=C12CCN(C(=O)CC#CC3=CC=CC=C3)C(=O)CC#CC4=CC=CC=C4C5=CC=CC=C5C6=CC=CC=C6 >> [Heat] C1CC2C(C1)OC(=O)C2C3=CC=CC=C3C4=CC=CC=C4C5=CC=CC=C5C6=CC=CC=C6C7=CC=CC=C7C8=CC=CC=C8
3. C1CC2C(C1)C=C(C2)C3=CC=CC=C3C4=CC=C(C=C4)OC >> [PhI(OAc)2, DCM, RT, 2 h] ? C25H20O3N2
4. CC(O)C(N)C(O)C1=CC=CC=C1 >> [i) EtC#N+ Cl-, ii) NaH then MeI] CC1=NC(O)C(C1)C(O)C2=CC=CC=C2 >> [i) BuLi then EtI, ii) H3O+] CC(O)C(N)C(O)C1=CC=CC=C1
5. CC(O)C(N)C(O)C1=CC=CC=C1 >> [i) PivCl, Et3N, THF; ii) n-BuLi, auxiliary; iii) TiCl4, DIEA, DCM, cyclic acetal; iv) H2, Pd/C, MeOH] CC(O)C(N)C(O)C1=CC=CC=C1