Total Synthesis of (±)-Maoecrystal V

1. TsNH₂H₂, EIOH
2. Ethylene glycol, HOCH₂CH₂O, Na₂, 180 °C
3. Me₃CO₃, NaN₃, THF, Δ
4. A. pyr, CHCl₃
5. n-Bu₃,NBH₃, MeOH
6. LAH, THF

Step 2: Name Reaction and Mechanism? Bamford-Stevens Reaction (in protic solvent)
- via carbocation (vs. via carbene)

Step 4: Name Reaction? Pinhey Amination
Step 5-6: Please come up with a rationale for a 2-step strategy instead of a one-pot reduction.
- DBAL and LAH gave wrong diastereomer (1:6)
  - also organoboranes, Na₂BH₄/Lewis Acid and hydrocarbonylamine gave wrong diastereomer
  - ammonium borohydride: desired selectivity due to directing and accelerating effect of the cationic-n-interaction between ammonium salt and the phenyl ring of the substrate, which delivers the hydride to the ketone from its freezing point

7. B. EDCI, DMAP, CH₂Cl₂
8. DBU, TsNH₂, CH₂Cl₂
9. Rh₂(OAc)₄, benzene, reflux
10. (HCHO)₂, t-BuOK, THF

Step 8: Name Reaction? Usually this reaction works only for 1,3-dicarbonyl compounds. Do you know a 2-step procedure to transform simple ketones into the desired product?
- Regitz Diazotransfer
  - (Danheiser Modification using hexafluoro acetalacetate)

11. TFA, CH₂Cl₂
12. Pb₂(OMe)₂, AcOH, 0 °C
13. PhMe, 145 °C
14. NBS, benzoyl peroxide, CCl₄, reflux
15. Bu₃SnH, TEMPO, PhH, reflux
16. Zn, AcOH, THF/H₂O
17. SmI₂, THF, MeOH
18. Lindlar cat.
19. DMP
20. DBU, PhMe, 100 °C

Step 12: Name Reaction?
- Wessely oxidative deamination

Step 18: composition of Lindlar cat.?
- Pd-CoCaO₂
- Pb(OAc)₂
- quinoline

Maoecrystal V