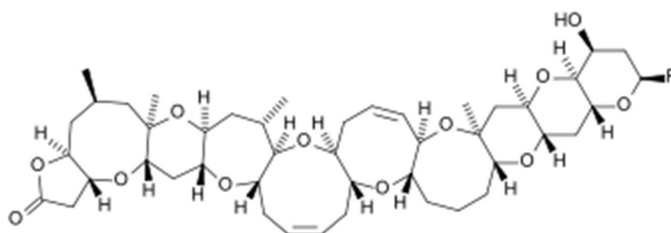
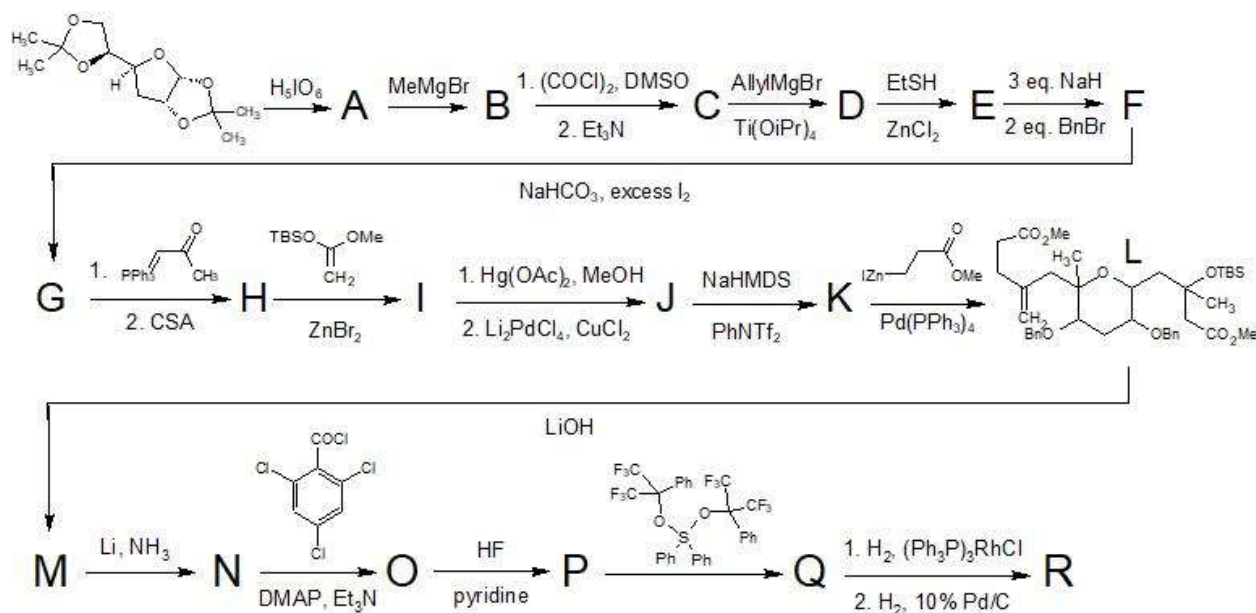


Brevetoxin A is a complex natural product with the structure shown below:



Its synthesis took years of effort and required over 100 steps. One of the intermediates used in the synthesis was synthesized from a derivative of D-glucose as follows:



Information:

Me = -CH₃, DMSO = Me₂SO, Allyl = -CH₂-CH=CH₂, iPr = -CH(CH₃)₂, Et = -CH₂CH₃, Ph = -C₆H₅, Bn = -CH₂Ph, CSA is a strong acid, TBS = -SiMe₂(CMe₃), Ac = -COCH₃, NaHMDS is a strong base, Tf = -SO₂CF₃, DMAP = 4-aminodimethylpyridine.

Hints:

- **A** has formula C₈H₁₂O₄
- **E** has formula C₁₃H₂₆S₂O₃ and is not cyclic
- **G** contains a six-membered heterocycle
- The structure of **L** is given within the scheme without stereochemistry, but you will be required to draw it with stereochemistry in this problem.
- **O** has three cycles
- Intermediates **B** and **I - P** represent two diastereomers.
- The transformation **Q** -> **R** sets 2 stereocenters, one in each step.

Draw the intermediates A-R with stereochemistry.

