Suggest reagents and conditions for the following transformations:

1. (10 points)

2. (10 points)

3. (10 points)

4. (10 points)

(optically active)

5. (10 points)

6. (10 points)

7. (10 points)

8. (10 points)

Draw the structures of: Ph-O-TIPS, Ph-O-MOM, Ph-O-SEM, Ph-O-Troc, Ph-O-Bn

9. (10 points)

Draw the structures of: Ph-NH-Boc, Ph-NH-Fmoc, Ph-NH-Cbz, Ph-NH-Tr, Ph-NH-Ac

10. (10 points)

Suggest the mechanism of the formation of this "unexpected" product of the following reaction: