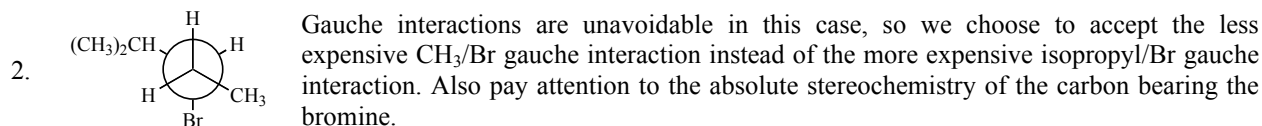


Statistics: High score, average, and low score will be posted on the course web site after exam grading is complete. The exam is ready to be picked up when these numbers are posted.

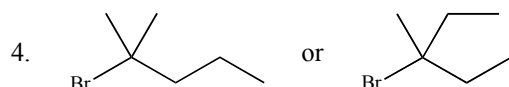
Some questions have more than one answer, even though only one answer may be listed here.

To see the final course grade cutoffs, consult the grading scale on the Chemistry 30A course web page.

1. (*R*)-3-bromo-2-methylpentane



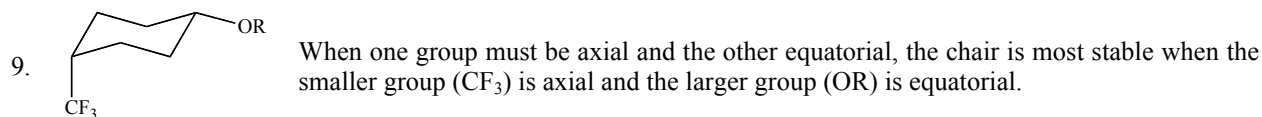
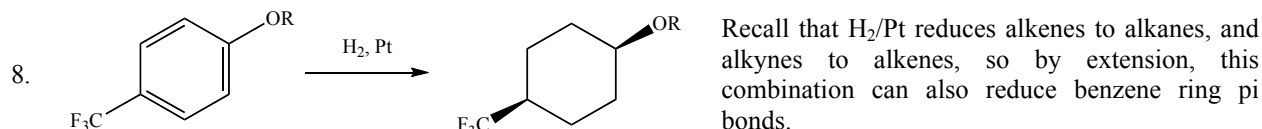
3. Of the infinite number of conformations for this bond of molecule **A**, this one has the least strain and the lowest energy because it has the least electron repulsion.



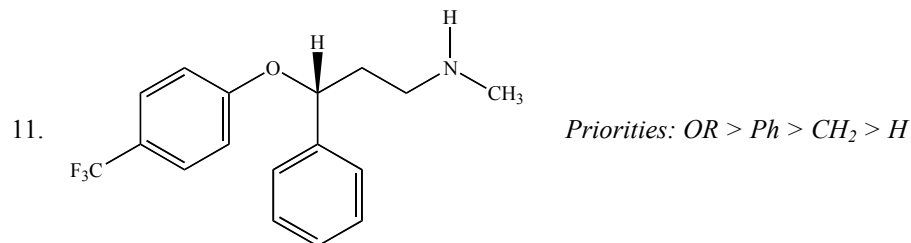
5. Alkene and amide. *We do not say that a functional group contains a simpler functional group. For example a benzene ring does not contain alkenes, and a carboxylic acid does not contain an alcohol.*

6. sp^3 The nitrogen bears four electron groups (H, CH₃, CH₂, and lone pair) and has no need for the lone pair to be in a p_z orbital.

7. F = 4.0, C = 2.5, H = 2.1, N = 3.0, and O = 3.5

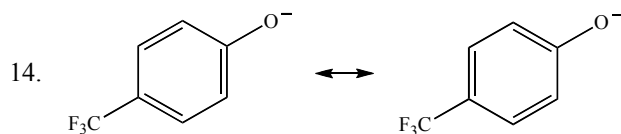


10. Fluoxetine has one stereocenter.



12. Therefore Prozac contains two fluoxetine stereoisomers that are enantiomers of other fluoxetine stereoisomers, and zero fluoxetine stereoisomers that are diastereomers of other fluoxetine stereoisomers.

13. Based on question 12 the word or phrase which best describes the stereoisomer mix present in Prozac is racemic mixture.

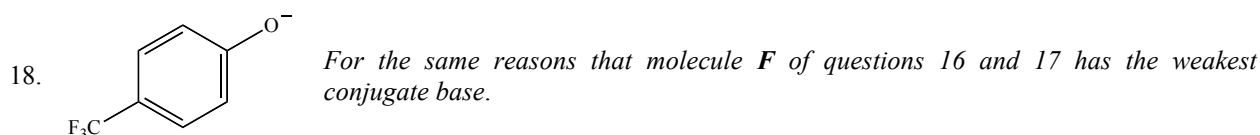


15. Equal significance (if you drew the other Kekulé structure) or Contributor 1 (if you drew anything other than the other Kekulé structure). *Of the many possible additional resonance contributors, all but one violate at least one resonance contributor preference rule, so no are more significant than contributor 1. Only the other Kekulé contributor (the contributor with the benzene ring pi bonds shifted) has equal significance.*

16. **C** has the least acidic OH group and **F** has the most acidic OH group.

17. Reason #1: Resonance stabilization of the conjugate base.

Reason #2: Inductive stabilization of the conjugate base by CF₃.



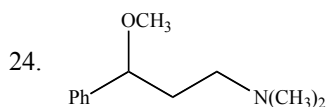
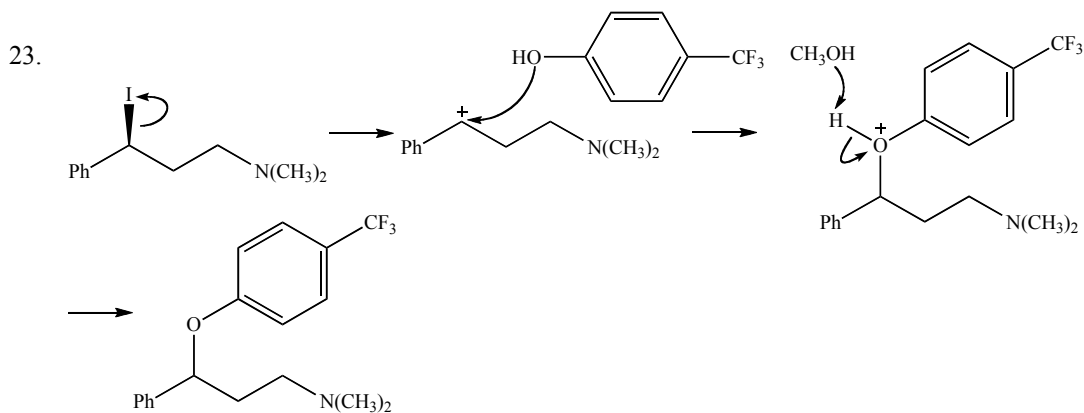
19. Acetone

20. LG = I. This is the best leaving group because iodine has a larger atomic radius than fluorine, chlorine, bromine, or oxygen.

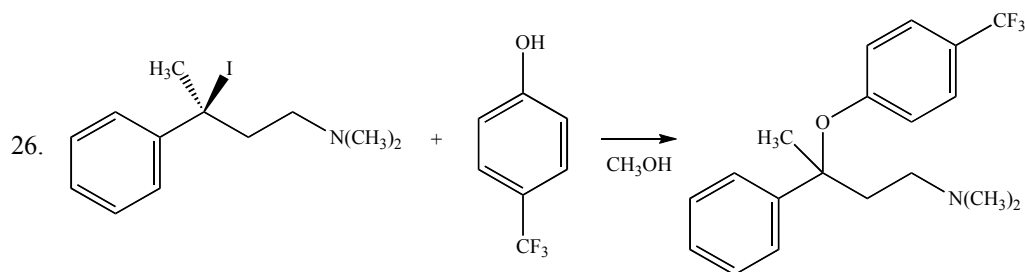
21. *S* An S_N2 reaction causes inversion at the carbon bearing the leaving group. If this carbon is an *S* stereocenter, the S_N2 reaction usually converts it to *R*. Exceptions exist (i.e., *S* inverted to *S*), but they are rare.

22. Reason #1: An amine is a poorer nucleophile than ArO⁻ (Ar = common abbreviation for an aromatic ring) due to the negative formal charge.

Reason #2: The intramolecular product has significant ring strain whereas the intermolecular product does not have ring strain.



25. Mostly *R*, some *S*. S_N1 reactions give a mixture of products that usually favor inversion over retention of stereochemistry at the carbon bearing the leaving group.



My revised reaction is faster than the given reaction because the carbocation intermediate in my reaction is more stable (3° with resonance versus 2° with resonance).

Many other changes are possible.

27. No, because no strong base is present.

