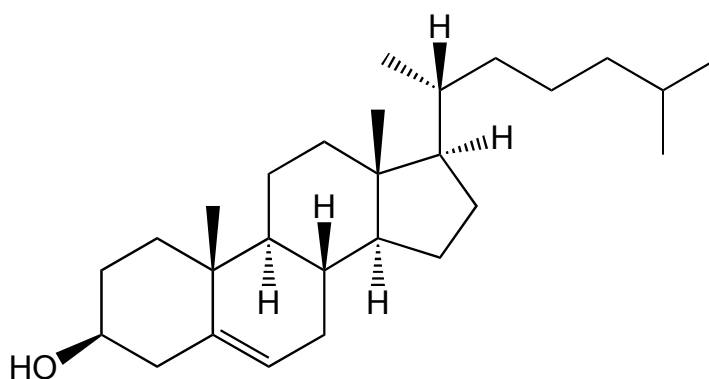
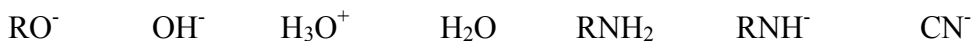


Chem 141 Problem Set 9
Wednesday 7th November 2007

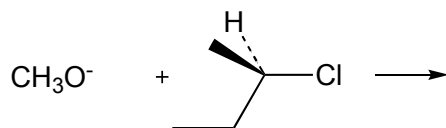
- Starting from 2-butyne, suggest two different synthetic routes to *meso*-2,3-dihydroxybutane.
- Starting from 2-butyne, suggest a synthetic route to a racemic mixture of (*R,R*) and (*S,S*)-2,3-dihydroxybutane.
- The following molecule is cholesterol. Assign *R* and *S* configurations to all the chiral atoms.



- Arrange the following in order of increasing nucleophilicity:



- Sodium acetylide (H-C≡C:⁻Na⁺) reacts with (*R*)-2-bromobutane to give (*S*)-3-methyl-1-pentyne. Does the reaction go with retention or inversion of configuration?
- The following reaction proceeds with inversion of stereochemistry:



- Draw the product indicating the stereochemistry, and assign *R* or *S* configuration
- In the *Finkelstein modification* potassium iodide KI is added to the reaction. The reaction proceeds 1000 times faster, and goes with retention of configuration. Why?