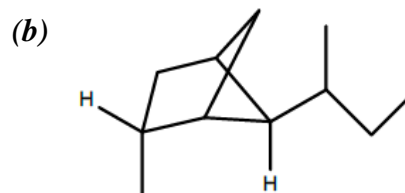
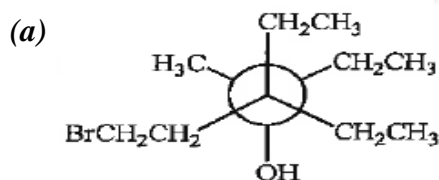


Organic Chemistry Practice Problems

Organic Chemistry I Practice Set #6 (Chapters 2-4 – Carey)

- 1) For each of the following compounds, provide a name. When necessary, be sure to designate appropriately each configuration (*cis*, *trans*, *endo*, *exo*, *syn*, *anti*) properly in the name.

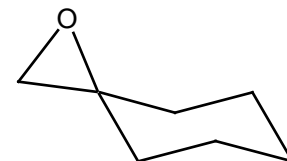
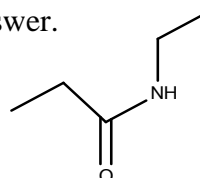
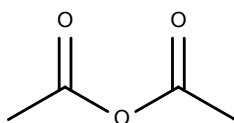
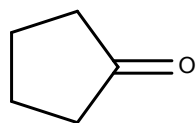


- 2) For each of the following, provide a structural formula. When necessary, be sure to designate appropriately each configuration (*cis*, *trans*, *endo*, *exo*, *syn*, *anti*) properly.

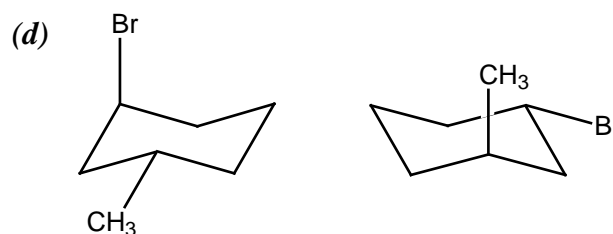
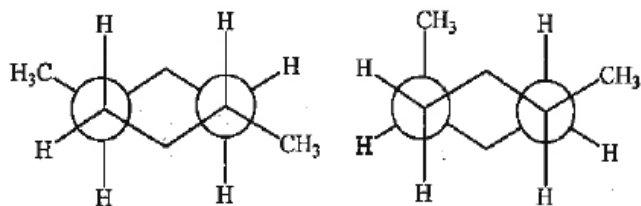
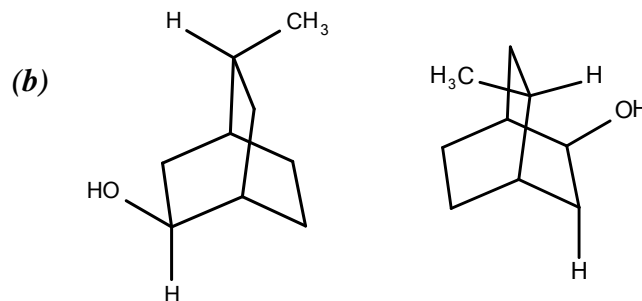
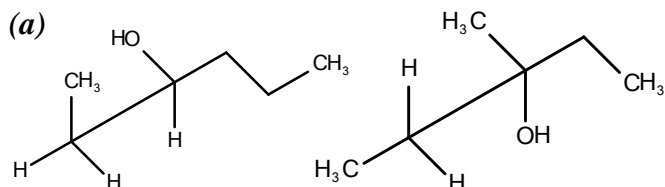
(a) piperidine

(b) spiro[3.4]octane

- 3) Give the name of the functional group class for each of the compounds given below. Be as specific as possible. Note that **carbonyl group** is **NOT** an acceptable answer.

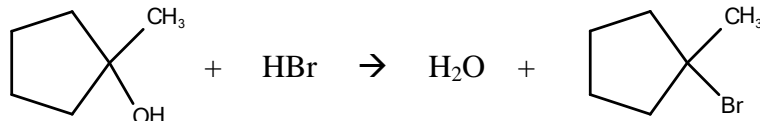


- 4) For each of the pairs shown below, give the best answer which describes the relationship between each molecule in the pair. Choose from: (i) **constitutional isomers**; (ii) **different conformations of the same compound**; (iii) **stereoisomers that cannot be interconverted by rotation about single bonds**; or (iv) **the same conformation of the same compound**.



Organic Chemistry Practice Problems

- 5) Consider the following reaction. Using arrows to show the flow of electrons, write a stepwise mechanism for this reaction.



- 6) Using arrows to show the flow of electrons, write a stepwise mechanism for the reaction of 1-propanol with hydrogen iodide to make 1-iodopropane and water.

- 7) (i) What is the hybridization of the central C (also known as C2) in $H_2C=C=CH_2$:

(a) sp^3 (b) sp^2 (c) sp (d) s (e) p

- (ii) Which compound has the smaller heat of combustion:

(a) *cis*-1,3-dimethylcyclohexane (b) *trans*-1,3-dimethylcyclohexane

- (iii) Which compound has the lower boiling point:

(a) $CH_3CH_2OCH_2CH_3$ (b) $CH_3CH_2CH_2CH_2OH$

- (iv) Which compound is less soluble in water:

(a) $CH_3(CH_2)_3OH$ (b) $CH_3(CH_2)_4OH$

- (v) Which compound is more oxidized:

(a) $CH_3CH_2CH_2OH$ (b) $CH_3CH_2CO_2H$

- (vi) Which compound is more dense in water:

(a) $CH_3CH_2CH_2F$ (b) $CH_3CH_2CH_2Cl$ (c) $CH_3CH_2CH_2Br$

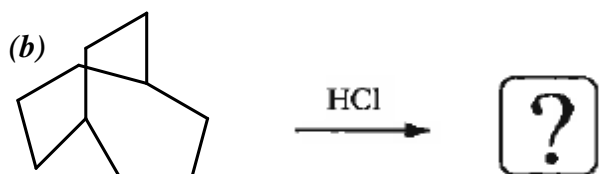
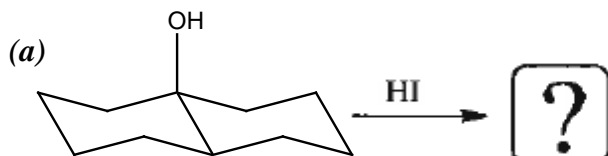
- (vii) Which compound has a lower boiling point:

(a) CH_3CH_2F (b) CF_3CF_3

- (viii) Which compound has a smaller heat of combustion:

(a) ethylcyclohexane (b) propylcyclohexane

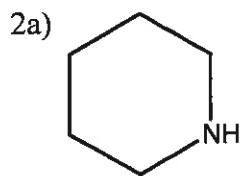
- 8) Fill in what is missing. Either give all of the missing reagents to complete the reaction or give a structural formula for the **major organic product(s)**. Show stereoisomers properly if necessary. If no reaction occurs, write **N.R.**



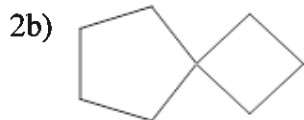
Organic Chemistry Practice Problems

Organic Chemistry I Answers to Practice Set #6 (Chapters 2-4 – Carey)

1a) 6-bromo-4,4-diethyl-3-methylhexan-3-ol 1b) 5-sec-butyl-2-methylbicyclo[2.1.1]hexane

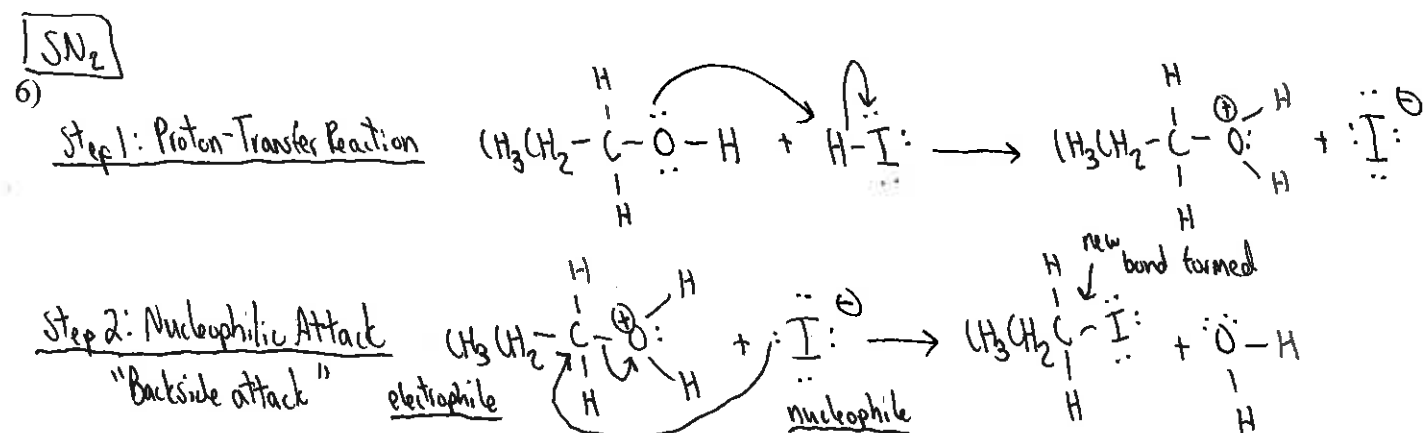
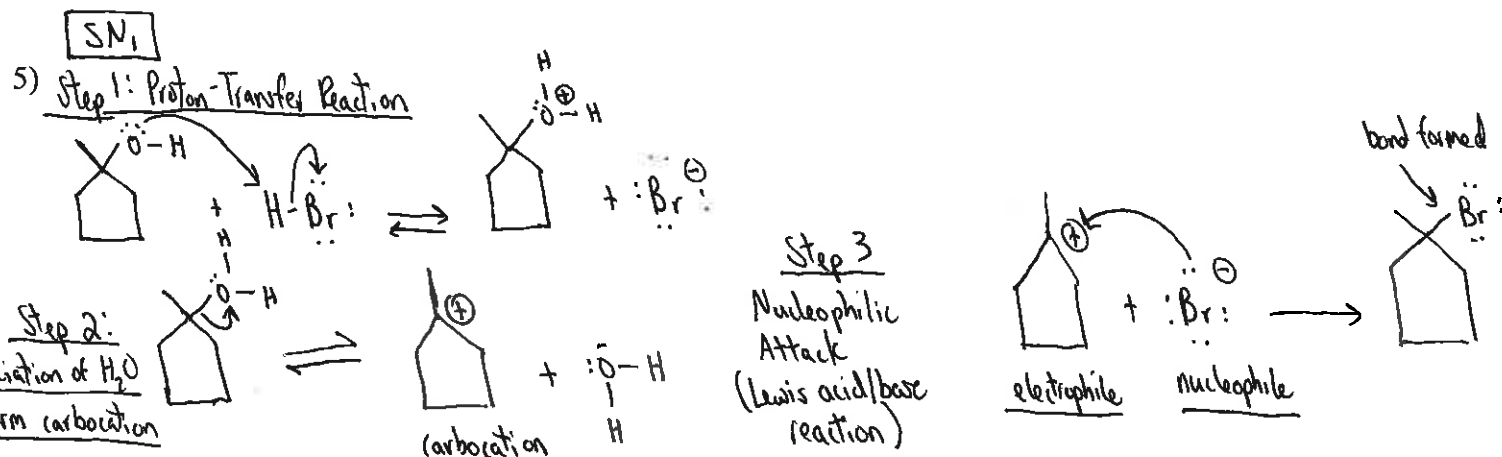


piperidine

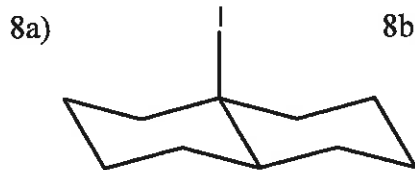


3a) tertiary alcohol 3b) ketone 3c) acid anhydride 3d) epoxide
3e) secondary amide

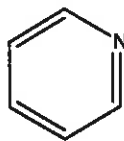
4a) i 4b) iv 4c) iii 4d) ii



7i) sp 7ii) a 7iii) a 7iv) b 7v) b 7vi) c 7vii) b 7viii) a



8b) N.R. 8c) PBr₃ 8d) SOCl₂,



pyridine