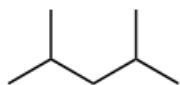


Library of Organic Chemistry Active Learning Resources LOCAL
Chapter 1 General Chemistry Review - Part 3 (physical properties)
& Chapter 2 - Part 1 (line drawings, lone pairs and formal charges)



1 Arrange the given compounds in the order of INCREASING boiling point (from lowest bp to highest bp).



I

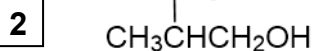


II

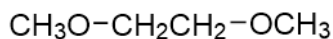


III

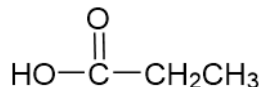
Chapter 1, Part 3 (Physical Properties) – Practice Problems
& Ch. 2, Part 1 (line drawings, lone pairs and formal charges)



I

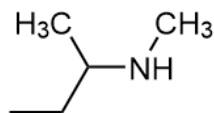


II

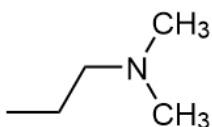


III

3 Which has the higher boiling point/bp (A, B or neither)?
Explain briefly.

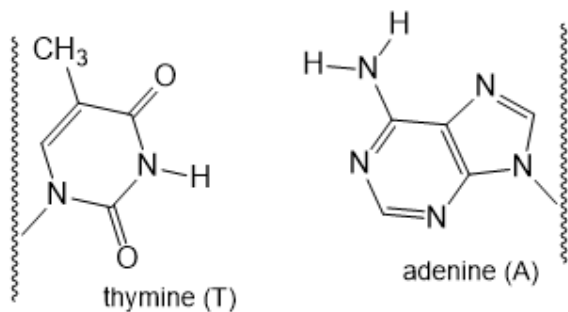


A

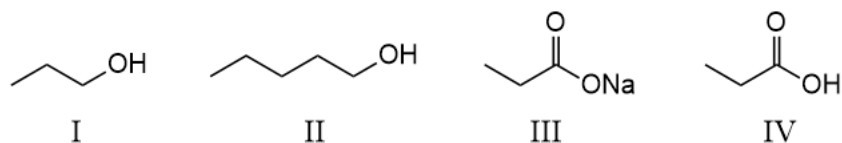


B

4 Demonstrate hydrogen-bonding in DNA base pairs:

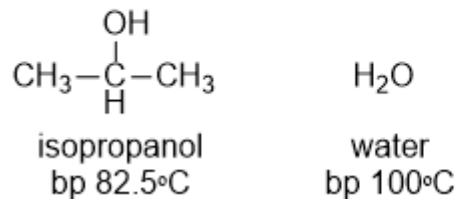


5 Arrange the given species in the order of INCREASING water solubility (from lowest to highest solubility).



6

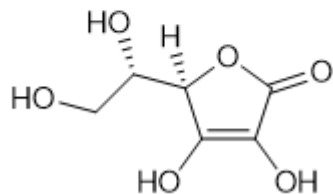
Group work: Isopropanol has a higher molar mass and more hydrogen atoms than water, yet water has the higher boiling point. Explain, using drawings to support your answer.



7 **Chapter 2 – Part 1 Worksheet**

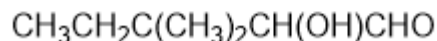
Shown below is the structures of ascorbic acid (vitamin C), an antioxidant that protects against scurvy.

- Draw in any missing hydrogen atoms.
- What is the molecular formula of Vitamin C? Use format $C_xH_yO_z$.



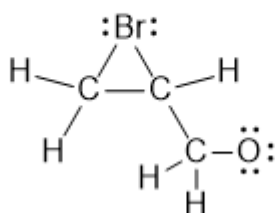
vitamin C formula: _____

- 9** Draw expanded structure (draw all atoms), given the following condensed formula, and then provide a bond-line drawing.

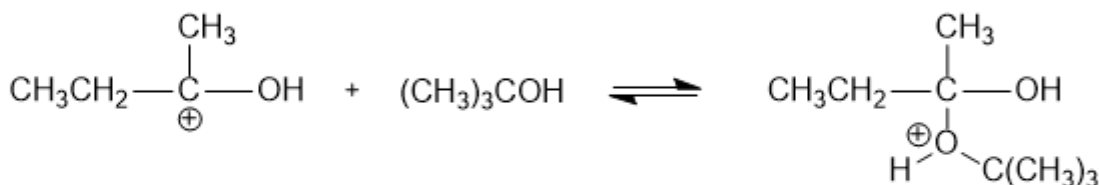
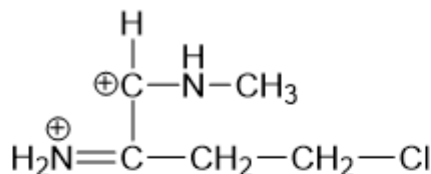


Identify missing **formal charges** (all lone pairs are shown).

8



- 10** Identify missing **lone pairs** (all formal charges are shown).

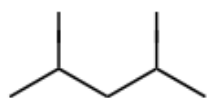


Redraw the reaction shown above, using line drawings:

After completing all of the above Lewis structures, **circle any atoms that are missing an octet.**

1

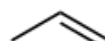
Arrange the given compounds in the order of INCREASING boiling point (from lowest bp to highest bp).



I



II



III

A) I < II < III

B) II < I < III

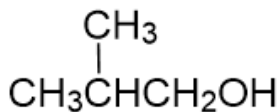
C) I < III < II

D) II < III < I

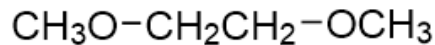
E) III < II < I

2

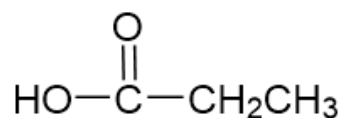
Arrange the given species in the order of INCREASING boiling point (from lowest bp to highest bp).



I



II



III

A) I < II < III

B) II < I < III

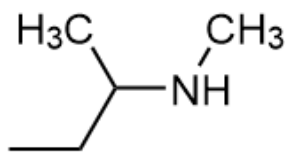
C) I < III < II

D) II < III < I

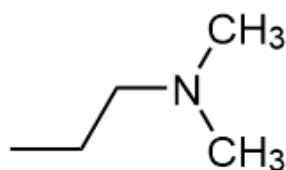
E) III < II < I

Which has the higher boiling point/bp (A, B or neither)?
Explain briefly.

3



A

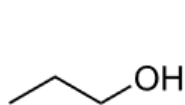


B

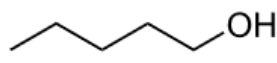
- A) Neither bp is higher because they are both amines.
- B) A has the higher bp because it is less branched (A has more van der Waals attractions).
- C) A has the higher bp because it has a hydrogen bond.
- D) A has the higher bp because the N-H bond is strong.
- E) A has the higher bp because the N-H group can form hydrogen bonds.

Arrange the given species in the order of INCREASING water solubility (from lowest to highest solubility).

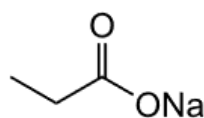
5



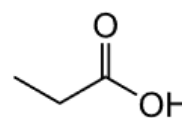
I



II



III

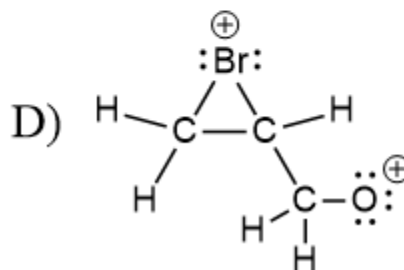
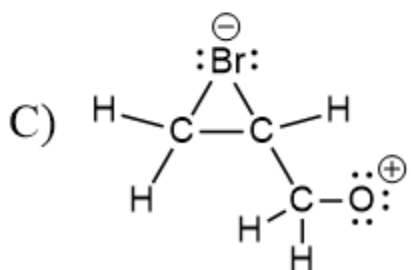
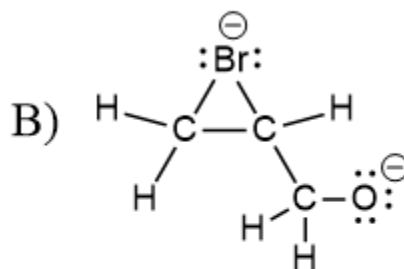
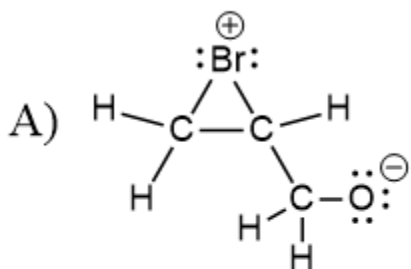


IV

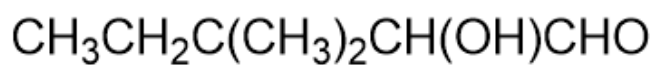
- A) II < I < III < IV
- B) I < II < III < IV
- C) II < IV < I < III
- D) II < I < IV < III
- E) III < IV < II < I

8

Which of the following has the correct formal charges on the given structure? (all lone pairs are shown)



9



Provide a bond-line drawing for the given condensed formula.

