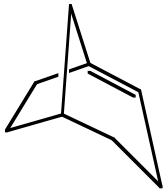
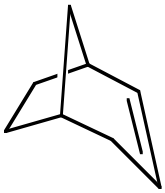
**1.** There are 7 isomers with the molecular formula $C_4H_{10}O$. Draw and name each of them below. Label them from A-G and answer the questions that follow:

a) Which of these have 3° carbons? _____ b) Which of these have 3° hydrogens?

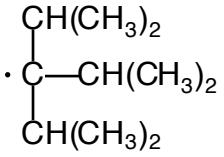
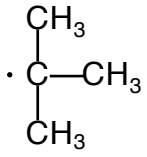
_____

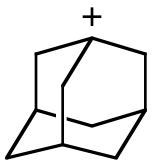
c) Rank them from lowest to highest in boiling and provide a rationale for your ranking:

**2.** Since the beginning of your studies in ochem, you have seen that molecules and intermediates often follow certain trends of stability. The following chemical structures (on the left-hand side) all seemingly buck the trends that you have encountered because of other overriding properties/concepts in organic chemistry. Knowing this, use your knowledge of OChem to explain the following observations. *Hint: making models of some of them might help*.

A)  is *less* stable than 

B) The *trans*-isomer of cyclooctene is *less* stable than the *cis*-isomer.

C)  is $sp^2$ hybridized while  is $sp^3$ hybridized

D)  is *less* stable than