The fool doth think he is wise, but the wise man knows himself to be a fool – William Shakespeare

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Questions 1–10 are worth **3** points each. The bonus is worth **5** points.

1. Which of the following chemical compounds will deprotonate an alcohol (R–OH) to give the corresponding sodium alkoxide species ($R–O^- Na^+$)?

A NaSH

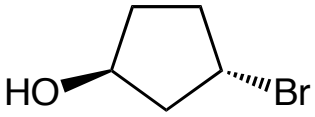
B NaCN

C $NaNH_2$

D All of the above

E None of the above

2. What is the correct name of the compound shown below?



A (1S, 3R)-3-bromocyclopentan-1-ol

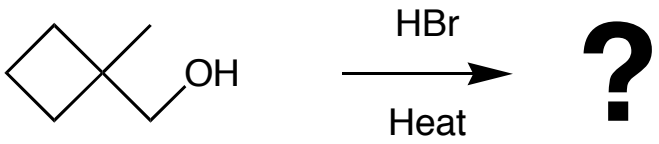
B (1S, 3S)-1-bromocyclopentan-3-ol

C (1R, 3S)-1-bromocyclopentan-3-ol

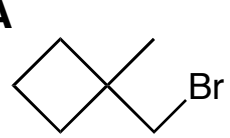
D (1S, 3S)-3-bromocyclopentan-1-ol

E (1R, 3S)-3-bromocyclopentan-1-ol

3. What is the MAJOR product of the bromination reaction shown below?



A



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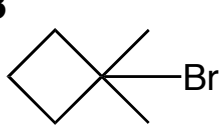

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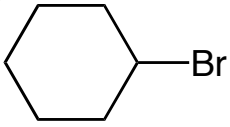

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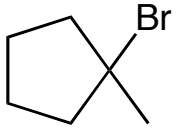
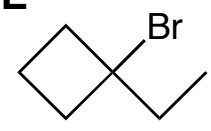
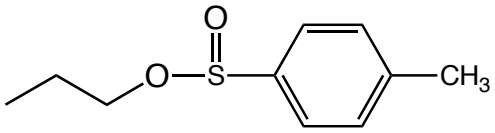


E



4. What is the correct chemical structure for propyl tosylate?

A



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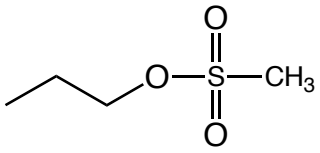

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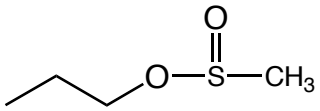

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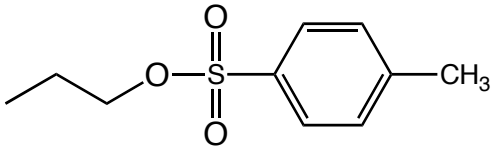

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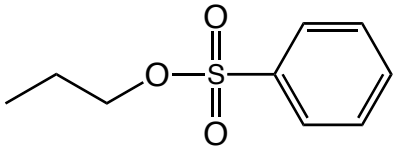
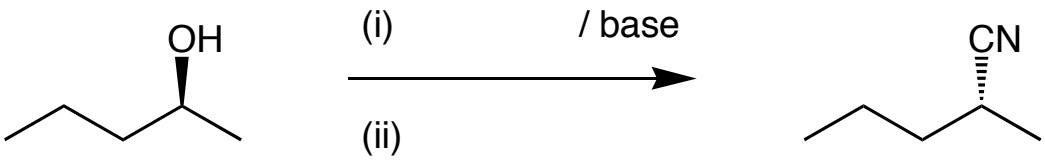


5. In the reaction scheme shown below, what are the reagents necessary for the exact transformation as shown?



A (i) TsCl (ii) $NaNH_2$

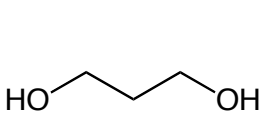
B (i) PCl_3 (ii) KCN

C (i) H_3PO_4 (ii) HCN

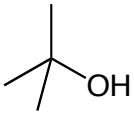
D (i) PBr_3 (ii) $K_2Cr_2O_7$

E (i) MsCl (ii) KCN

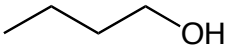
6. What is the correct order of boiling points from LOWEST to HIGHEST of the following alcohols?



1



2



3

A 2, 3, 1

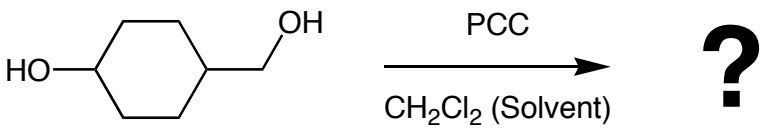
B 3, 2, 1

C 3, 1, 2

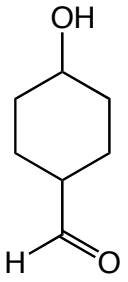
D 1, 2, 3

E 1, 3, 2

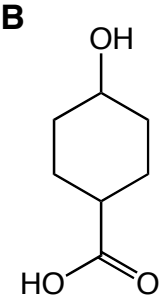
7. What is the product of the pyridinium chlorochromate (PCC) oxidation shown below?



A



B



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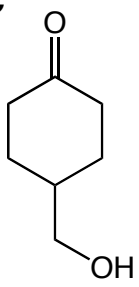

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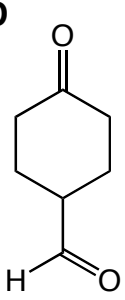

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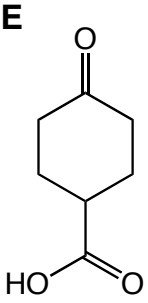
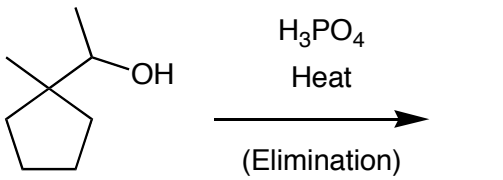
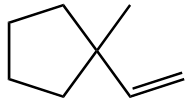


8. What is the major product of the acid-catalyzed dehydration (elimination) reaction shown below?



A



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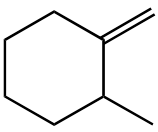

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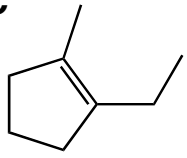

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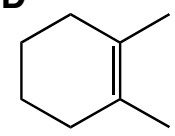

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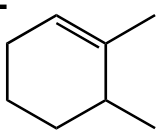


9. When a primary or secondary alcohol is oxidized with chromic acid (H_2CrO_4), the first step of the mechanism involves the formation of a species called a chromate ester – what is the oxidation state of the Cr atom in this species?

A VII

B VI

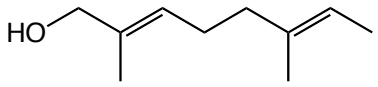
C V

D IV

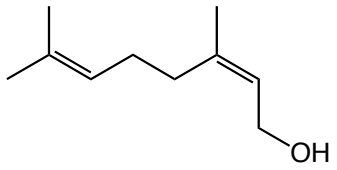
E III

10. What is the chemical structure of (2E)-3,7-dimethylocta-2,6-dien-1-ol?

A



B



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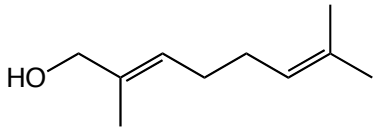
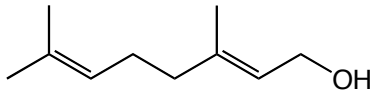
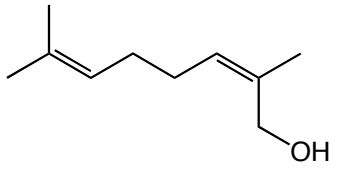


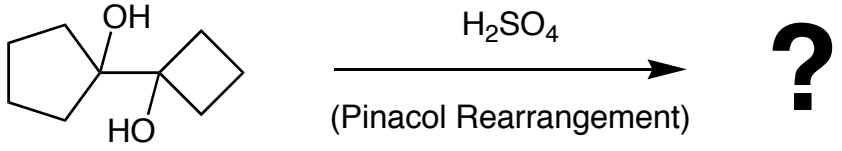
D



E



BONUS QUESTION: What is the product of the Pinacol rearrangement shown below? Write your answer (just the structure) clearly in the box provided on the cover sheet to this quiz. There will be NO partial credit – either your structure is right or wrong. The next blank page can be used for working through the problem, but do not hand that part in.



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