ChemHL Alkene G11

* 您的姓名：

* 1. Which of the following statements about alkenes is NOT correct?

- A. They have reactive double bonds.
- B. They can form addition polymers.
- C. They react mainly by substitution.
- D. They can react with water to form alcohols.

* 2. Which of the following statements about alkenyl group is correct?

- A. The two carbon atoms are both sp3 hybridized.
- B. The shape around the carbon atoms are both tetrahedral.
- C. The two carbon-carbon bonds are pi bonds.
- D. The bond angle between the carbon-carbon bond and the neighboring bond is 120*.

* 3. Which of the following reaction mechanism is the most common for the reaction of alkenes?

- A. free radical substitution

- B. nucleophilic addition
- C. nucleophilic substitution
- D. electrophilic addition

* 4. Which of the following compound is the major product of the reaction between 2-methylbut-1-ene and hydrogen bromide?

- A. 1-bromo-3-methylbutane
- B. 1-bromo-2-methylbutane
- C. 2-bromo-3-methylbutane
- D. 2-bromo-2-methylbutane

* 5. Which of the following application of organic reactions is NOT correct?

- A. Halogenation of alkene can be used to produce CFCs.
- B. Hydrogenation of alkenyl group can be used to produce margarine.
- C. Addition polymerization of alkene can be used to produce various types of plastics.
- D. Hydration of alkene can be used to produce vinegar.

* 6. Which structure could represent a repeating unit of a polymer formed from propene?

- A. –CH2–CH(CH3)–
- B. –CH2–CH2–CH2–
- C. –CH(CH3)–CH(CH3)–
- D. –CH2–CH2–

* 7. What happens when a few drops of liquid bromine are added to excess hex-1-ene and the mixture is shaken?

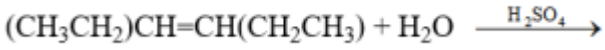
I. The orange colour of the bromine water disappears.

II. The organic product formed does not contain any carbon-carbon double bonds.

III. 2-bromohexane is formed.

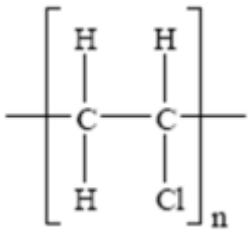
- A. I only
- B. I and II only
- C. I and III only
- D. I, II and III

* 8. Which organic product is formed in the following reaction?



- A. CH3(CH2)2CH(OH)CH2CH3
- B. CH3(CH2)5CH3
- C. CH3(CH2)2CH(OSO3H)CH2CH3
- D. CH3(CH2)6OH

* 9. Which monomer could be used to form a polymer with the following repeating unit?



- A. CH3CH2Cl
- B. CH2ClCH2Cl
- C. CH2CHCl
- D. CHClCHCl

* 10. Which compound forms when hydrogen bromide is added to but-2-ene?

- A. 2-bromobutane

B. 2,3-dibromobutane

C. 1-bromobutane

D. both A&C

* 11. Which products can be potentially obtained from crude oil and are economically important?

I. Plastics II. Margarine III. Motor fuel

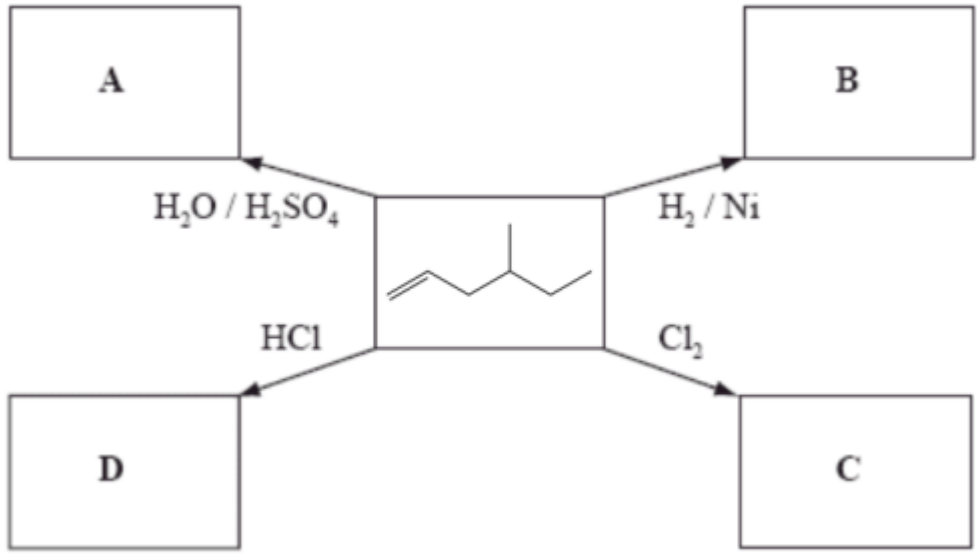
A. I and II only

B. I and III only

C. II and III only

D. I, II and III

* 12. Below is a schematic diagram representing some reactions of an alkene. The letters A–D represent the major organic compounds formed from the reactants and catalysts shown.



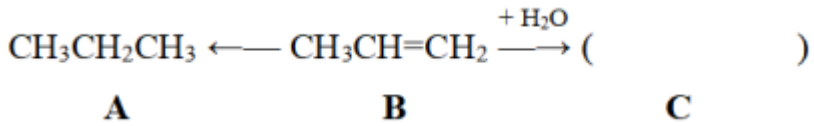
(a) The IUPAC name of A is _____ .

(b) The IUPAC name of B is _____ .

(c) The IUPAC name of C is _____ .

(d) The IUPAC name of D is _____ .

* 13. Two reactions of an alkene, B, are shown below.



(a) Balance the complete combustion reaction of B.

[ ] C_3H_6 + [ ] O_2 → [ ] CO_2 + [ ] H_2O

C is the minor product of the hydration of B.

(b) The condition of this reaction is [ ] and the catalyst used is [ ] (fill in with chemical formula).

(c) The IUPAC name of C is [ ] and it is a [ ] (fill in with primary, secondary, or tertiary) alcohol.

* (d) B can also react with HCl under room temperature and the major organic product is D.
Write equations to illustrate the mechanism of B→D using curly arrows to show the movement of electron pairs, showing structural formulae of all the species in the reaction. (please upload photo or screenshot as .jpg file for this question) [4]

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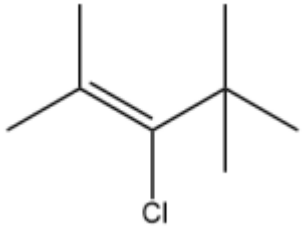
* (e) Another organic product, E, is also formed in the reaction in (d), but with much lower percentage than D.
Explain why D is the major product rather than E. [2]

* 14. Describe a chemical test that can be used to distinguish between hexane and hex-1-ene, stating the results for each case.

* 15. (a) Draw the structure of polymer when the following compound is the monomer (please upload photo or screenshot as .jpg file for this question). [2]



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* (b) The IUPAC name of the polymer formed in 15(a) is: [1]

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