

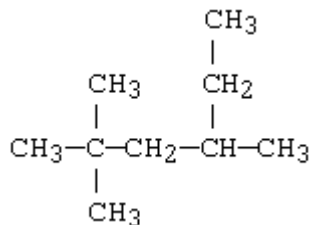
Your Name: _____ Student #: _____

Your course TA (Dave, Derek, Mark): _____

Exercise	key
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1. Please deliver only this page. You can keep the text. The solution key will be posted today on the web.
2. Scratch paper is at the end.
3. Solution key will be posted today.
4. Marks will be posted on Virtual Campus Gradebook ASAP.

1. A IUPAC name for the following compound is:

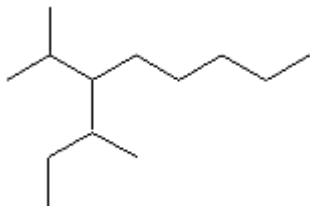


- A) 4-Ethyl-2,2-dimethylpentane
- B) 2-Ethyl-4,4-dimethylpentane
- C) 2,2,4-Trimethylhexane
- D) 3,5,5-Trimethylhexane
- E) 1-tert-Butyl-2-ethylpropane

2. Which of the following pairs of compounds represent pairs of constitutional isomers?

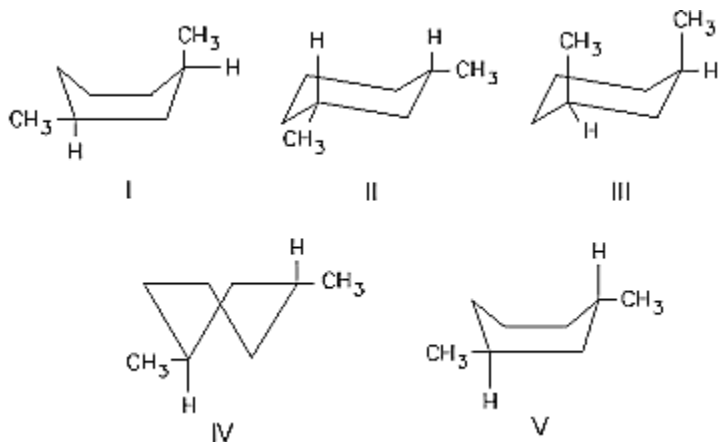
- A) 2-Methylbutane and pentane
- B) 2-Chlorohexane and 3-chlorohexane
- C) sec-Butyl bromide and tert-butyl bromide
- D) Propyl chloride and isopropyl chloride
- E) All of the above

3. What is a correct name for the following compound?



- A) 3-Isobutyl-2-methylheptane
- B) 3-sec-Butyl-2-methyloctane
- C) 5-Isobutyl-6-methylheptane
- D) 2-Ethyl-3-isopropyloctane
- E) 4-Isopropyl-3-methylnonane

4. What structure represents the most stable conformation of cis-1,3-dimethylcyclohexane?

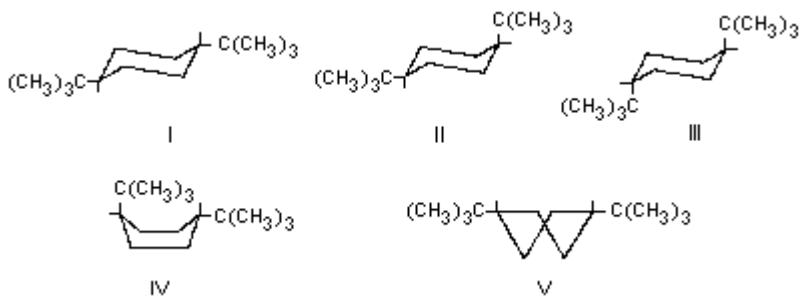


- A) I
- B) II
- C) III
- D) IV
- E) V

5. Which isomer would have the largest heat of combustion?

- A) Propylcyclopropane
- B) Ethylcyclobutane
- C) Methylcyclopentane
- D) Cyclohexane
- E) Since they are all isomers, all would have the same heat of combustion.

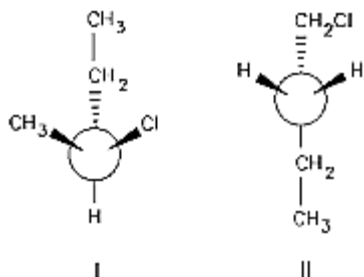
6. Which structure represents the most stable conformation of cis-1,4-di-tert-butylcyclohexane?



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

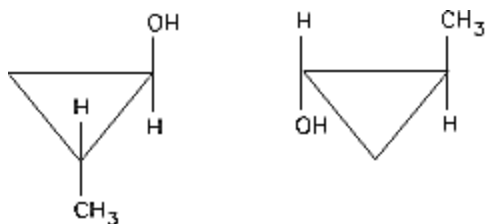
7. How many constitutional isomers are possible for the formula C_6H_{14} ?
- A) 2
 - B) 3
 - C) 4
 - D) 5
 - E) 6

8. I and II are:



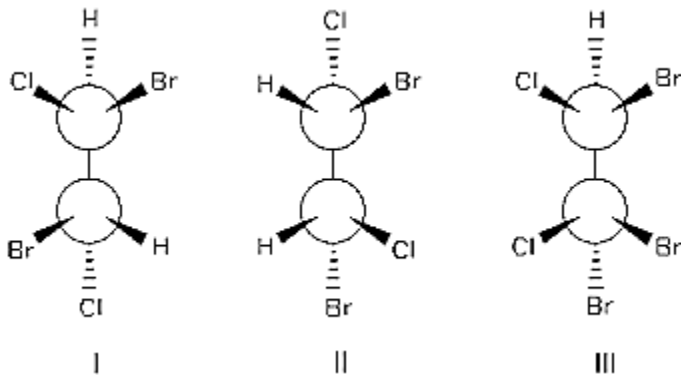
- A) constitutional isomers.
- B) enantiomers.
- C) non-superposable mirror images.
- D) diastereomers.
- E) not isomeric.

9. The molecules shown are:



- A) constitutional isomers.
- B) enantiomers.
- C) diastereomers.
- D) identical.
- E) None of these

10. Which molecule is achiral?



- A) I
 B) II
 C) III
 D) More than one of these
 E) None of these

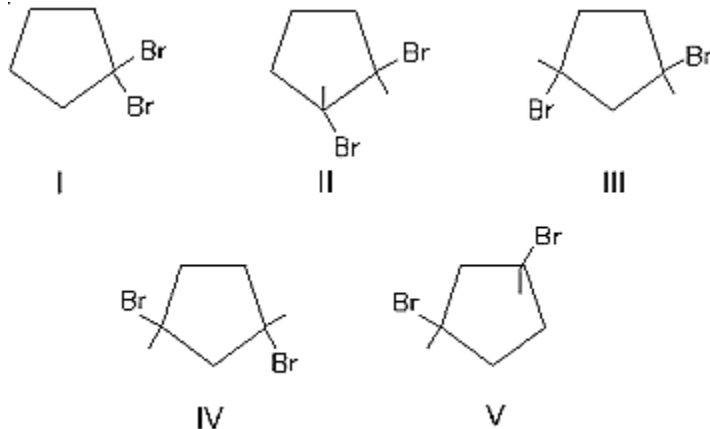
11. (2R,3S) -2,3-Dichlorobutane and (2S,3R)-2,3-dichlorobutane are:

- A) enantiomers
 B) diastereomers
 C) identical
 D) conformational isomers
 E) constitutional isomers

12. Which of the following molecules is achiral?

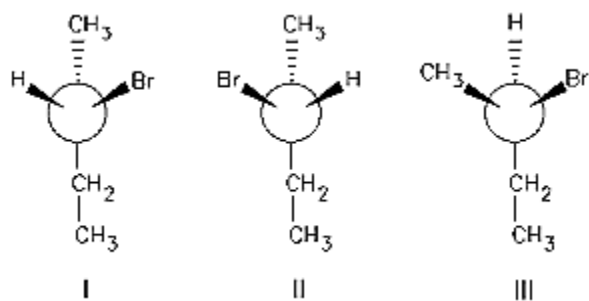
- A) (2R,3R)-2,3-Dichloropentane
 B) (2R,3S)-2,3-Dichloropentane
 C) (2S,3S)-2,3-Dichlorobutane
 D) (2R,3S)-2,3-Dichlorobutane
 E) None of these

13. Which of the following is a meso compound?



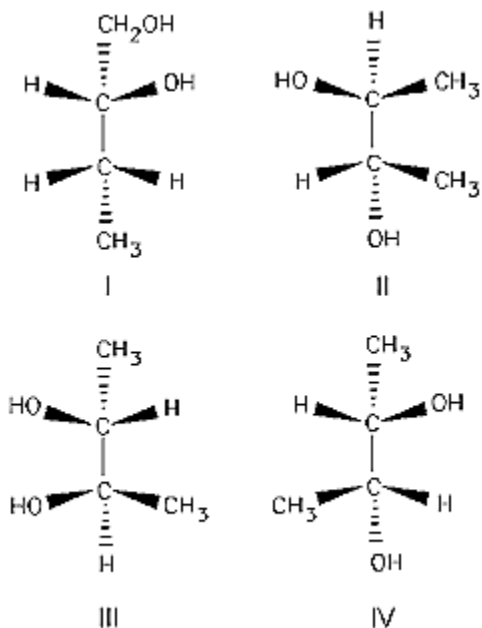
- A) I
- B) II
- C) III
- D) IV
- E) V

14. Which structure represents (S)-2-bromobutane?



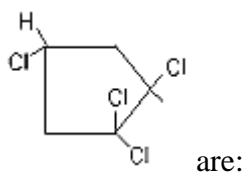
- A) I
- B) II
- C) III
- D) More than one of the above
- E) None of the above

15. Which of the compounds above (I-IV) represent enantiomers?



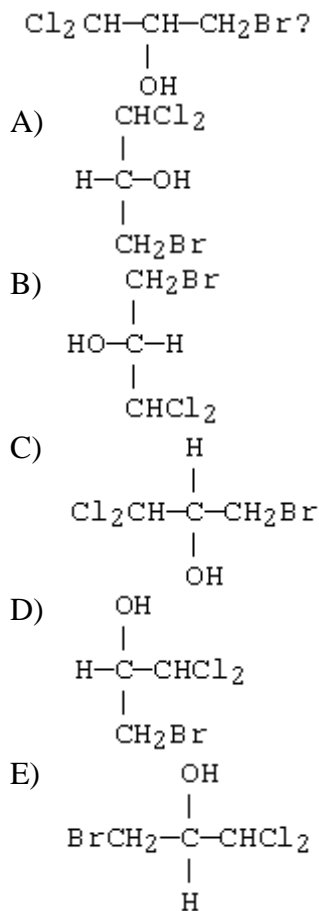
- A) I and II
- B) II and III
- C) III and IV
- D) II and IV
- E) III and IV

16. The Cahn-Ingold-Prelog stereochemical designations used for



- A) 2R,4S
- B) 2S,4R
- C) 2R,4R
- D) 2S,4S
- E) The R,S terminology doesn't apply in this case.

17. Which of these is not a correct representation of the (S) form of



18. Given the following bond dissociation energies:

	$\text{DH}^\circ(\text{kJ mol}^{-1})$
CH_3-H	440
$\text{H}-\text{F}$	570
$\text{H}-\text{Cl}$	432
$\text{H}-\text{Br}$	366
$\text{H}-\text{I}$	298

predict which of the following reactions would have the highest energy of activation.

- A) $\text{CH}_4 + \text{F}\cdot \longrightarrow \text{CH}_3\cdot + \text{HF}$
 B) $\text{CH}_4 + \text{Cl}\cdot \longrightarrow \text{CH}_3\cdot + \text{HCl}$
 C) $\text{CH}_4 + \text{Br}\cdot \longrightarrow \text{CH}_3\cdot + \text{HBr}$
 D) $\text{CH}_4 + \text{I}\cdot \longrightarrow \text{CH}_3\cdot + \text{HI}$

19. In the presence of light, ethane (1 mol) reacts with chlorine (1 mol) to form which product(s)?
- A) $\text{CH}_2\text{ClCHCl}_2$
 - B) CH_3CHCl_2
 - C) $\text{CH}_3\text{CH}_2\text{Cl}$
 - D) $\text{ClCH}_2\text{CH}_2\text{Cl}$
 - E) All of these
20. How many monochloro derivatives, including stereoisomers, can be formed in the chlorination of 1-iodobutane?
- A) 4
 - B) 5
 - C) 6
 - D) 7
 - E) 8
21. The hybridization state of the carbon of a methyl radical is:
- A) sp
 - B) sp^2
 - C) sp^3
 - D) sp^4
 - E) p^3

Answer Key

1. C
2. E

3. E

4. B
5. A
6. E
7. D
8. A
9. B
10. A
11. C
12. D
13. E
14. A
15. B
16. C
17. D
18. D
19. E
20. D

21. B