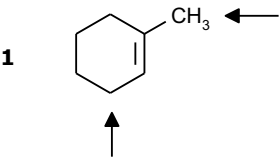
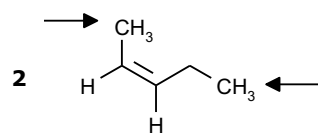
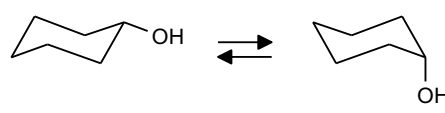
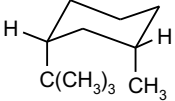
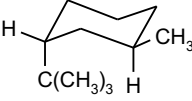
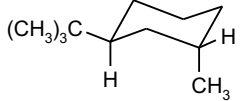
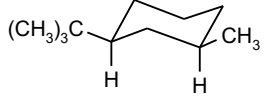
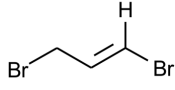
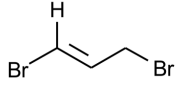
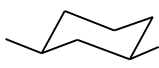


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| 1. | Indicate which compound is a trans-type cyclohexane.. <p>(1) 1,2-Dimethylcyclohexane, with two equatorial substituents; (2) 1,3- Dimethylcyclohexane, with two equatorial substituents.</p> <p>A) 1 = Yes; 2 = Yes. C) 1 = No; 2 = Yes.</p> <p>B) 1 = Yes; 2 = No. D) 1 = No; 2 = No.</p> |
| 2. | Indicate which molecule exhibits geometric isomerism. <p>(1) 1- Heptene; (2) 2-METHYL-2-heptene.</p> <p>A) 1 = Yes; 2 = Yes. C) 1 = No; 2 = Yes.</p> <p>B) 1 = Yes; 2 = No. D) 1 = No; 2 = No.</p> |
| 3. | Indicate which statement is correct. <p>(1) In the chair conformation of cyclohexane, there are 12 axial hydrogens; (2) In an alkane, the staggered conformation is more stable than the eclipsed conformation due to steric repulsion.</p> <p>A) 1 = Yes; 2 = Yes. C) 1 = No; 2 = Yes.</p> <p>B) 1 = Yes; 2 = No. D) 1 = No; 2 = No.</p> |
| 4. | Indicate which statement is correct. <p>(1) Diastereomers rotate the plane of polarized light equally and in the same opposite direction.; (2) Diastereomers have the same boiling point.</p> <p>A) 1 = Yes; 2 = Yes. C) 1 = No; 2 = Yes.</p> <p>B) 1 = Yes; 2 = No. D) 1 = No; 2 = No.</p> |
| 5. | Knowing that the equilibrium constant for the following conversion is K = 5, estimate the percentage of molecules in which the OH substituent is in the axial position. <div style="text-align: center;"> </div> <p>A) <1%. B) 17%. C) 50%. D) 99%.</p> |
| 6. | Indicate whether the following compounds are isomers. <p>(1) Isopropyl propyl ether and 2,3-dimethyl-1-butanol; (2) Cyclohexanol and methyl pentyl ether.</p> <p>A) 1 = Yes; 2 = Yes. C) 1 = No; 2 = Yes.</p> <p>B) 1 = Yes; 2 = No. D) 1 = No; 2 = No.</p> |

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| 7. | <p>Indicate whether the carbon atoms indicated by the arrows are on the same plane..</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>1</p>  </div> <div style="text-align: center;"> <p>2</p>  </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 48%;"> <p>A) 1 = Yes; 2 = Yes.</p> <p>C) 1 = No; 2 = Yes.</p> </div> <div style="width: 48%;"> <p>B) 1 = Yes; 2 = No.</p> <p>D) 1 = No; 2 = No.</p> </div> </div> |
| 8. | <p>Indicate which statement is correct.</p> <p>(1) In cyclohexane, there is no free rotation around the C-C bonds of the ring.;</p> <p>(2) In an alkane, the staggered conformation is less stable than the eclipsed conformation.</p> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 48%;"> <p>A) 1 = Yes; 2 = Yes.</p> <p>C) 1 = No; 2 = Yes.</p> </div> <div style="width: 48%;"> <p>B) 1 = Yes; 2 = No.</p> <p>D) 1 = No; 2 = No.</p> </div> </div> |
| 9. | <p>Indicate in which isomer of dimethylcyclohexane the two chair conformations have the same energy.</p> <p>(1) <i>trans</i>-1,4-Dimethylcyclohexane; (2) 1,1- Dimethylcyclohexane.</p> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 48%;"> <p>A) 1 = Yes; 2 = Yes.</p> <p>C) 1 = No; 2 = Yes.</p> </div> <div style="width: 48%;"> <p>B) 1 = Yes; 2 = No.</p> <p>D) 1 = No; 2 = No.</p> </div> </div> |
| 10. | <p>Indicate whether the following carbonyl compounds are isomers.</p> <p>(1) 2-Ethylpentanal and 3-Methylpentanal;</p> <p>(2) 2,4,3-Trimethylpentanal and 2-Ethyl-3-methylbutanal.</p> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 48%;"> <p>A) 1 = Yes; 2 = Yes.</p> <p>C) 1 = No; 2 = Yes.</p> </div> <div style="width: 48%;"> <p>B) 1 = Yes; 2 = No.</p> <p>D) 1 = No; 2 = No.</p> </div> </div> |
| 11. | <p>Indicate which compound exhibits geometric isomerism.</p> <p>(1) 1,1- Dimethylcyclopentane; (2) 1,1- Dibromocyclohexane.</p> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 48%;"> <p>A) 1 = Yes; 2 = Yes.</p> <p>C) 1 = No; 2 = Yes.</p> </div> <div style="width: 48%;"> <p>B) 1 = Yes; 2 = No.</p> <p>D) 1 = No; 2 = No.</p> </div> </div> |
| 12. | <p>Indicate how many compounds are formed by a cyclopropane ring and two CH₃ groups, not considering enantiomers as different molecules.</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p>A) 1.</p> <p>B) 2.</p> <p>C) 3.</p> <p>D) 4.</p> </div> |
| 13. | <p>Knowing that the equilibrium constant for the following conversion is K = 0.2, estimate the percentage of molecules in which the OH substituent is in the equatorial position.</p> <div style="text-align: center; margin: 10px 0;">  </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="width: 48%;"> <p>A) <1%.</p> <p>B) 15%.</p> </div> <div style="width: 48%;"> <p>C) 50%.</p> <p>D) 85%.</p> </div> </div> |

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| 14. | <p>Indicate the most stable form of cis-1-<i>tert</i>-butyl-3-methylcyclohexane.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>A</p> </div> <div style="text-align: center;">  <p>B</p> </div> <div style="text-align: center;">  <p>C</p> </div> <div style="text-align: center;">  <p>D</p> </div> </div> |
| 15. | <p>Indicate the relationship between the following structures.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p> A) They are enantiomers. B) It is the same compound. C) They are structural isomers. D) They are geometric isomers. </p> |
| 16. | <p>Indicate which compounds exhibit geometric isomerism..</p> <p style="text-align: center;">(1) 1-Hexene; (2) 2,3-dimethyl-2-hexene.</p> <p> A) 1 = Yes; 2 = Yes. B) 1 = Yes; 2 = No. C) 1 = No; 2 = Yes. D) 1 = No; 2 = No. </p> |
| 17. | <p>The figure shows a chair conformation of 1,3-dimethylcyclohexane. Indicate which statement is correct.</p> <div style="text-align: center;">  </div> <p> A) It is the cis isomer, in the most stable conformation. B) It is the trans isomer, in the most stable conformation. C) It is the trans isomer, in the least stable conformation. D) It is the cis isomer; the two cis conformers have the same stability. </p> |
| 18. | <p>Indicate how many stereoisomers the following compound has..</p> <p style="text-align: center;">$\text{CH}_3\text{CH}_2\text{CHOHCH}_2\text{CHFCH}(\text{CH}_3)_2$</p> <p> A) 2. B) 4. C) 8. D) 16. </p> |
| 19. | <p>Indicate which compounds are isomers.</p> <p> A) 1-Propanol and 2-propanol. B) Methanoic acid and ethanoic acid. C) Methanol and methanal. D) Ethane and ethanol. </p> |
| 20. | <p>Indicate how many isomeric ethers of formula $\text{C}_5\text{H}_{12}\text{O}$ there are, considering stereoisomers as different molecules. Hint: first write down the ethers without considering stereoisomers, then evaluate how many of them are present as enantiomers..</p> <p> A) 5. B) 6. C) 7. D) 8. </p> |

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| 21. | Indicate which compound is a trans-type cyclohexane. |
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- (1) 1,3-Dimethylcyclohexane, with two axial substituents;
(2) 1,3-Dimethylcyclohexane, with two equatorial substituents.

A) **1** = Yes; **2** = Yes.

B) **1** = Yes; **2** = No.

C) **1** = No; **2** = Yes.

D) **1** = No; **2** = No.

22. Indicate which statement is correct.

- (1) In the chair conformation of cyclohexane, there are 6 equatorial hydrogens;
- (2) In cyclohexane, the axial substituents interact unfavorably with each other.

A) **1 = Yes; 2 = Yes.**

B) **1** = Yes; **2** = No.

C) **1** = No; **2** = Yes.

D) **1 = No; 2 = No.**