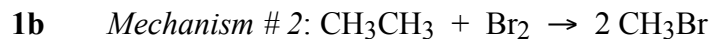
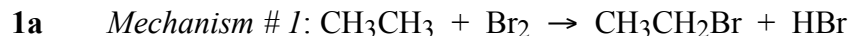


Answers



1c Mechanism # 1

$$\text{Step 1: } \Delta H^\circ = DH^\circ(\text{H}-\text{CH}_2\text{CH}_3) - DH^\circ(\text{H}-\text{Br}) = 101 - 88 = +13 \text{ kcal/mol}$$

$$\text{Step 2: } \Delta H^\circ = DH^\circ(\text{Br}-\text{Br}) - DH^\circ(\text{Br}-\text{CH}_2\text{CH}_3) = 53 - 71 = -18 \text{ kcal/mol}$$

Mechanism # 2

$$\text{Step 1: } \Delta H^\circ = DH^\circ(\text{H}_3\text{C}-\text{CH}_3) - DH^\circ(\text{Br}-\text{CH}_3) = 90 - 71 = +19 \text{ kcal/mol}$$

$$\text{Step 2: } \Delta H^\circ = DH^\circ(\text{Br}-\text{Br}) - DH^\circ(\text{Br}-\text{CH}_3) = 53 - 71 = -18 \text{ kcal/mol}$$

1d Mechanism # 1 is more likely.

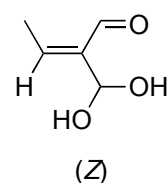
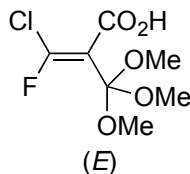
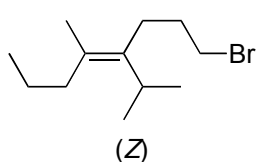
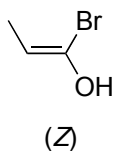
1e The first step of Mechanism # 1 is more thermodynamically favorable than the first step of Mechanism # 2 and is likely to have a smaller enthalpy of activation ΔH^\ddagger and thus take place at a faster rate than the first step of Mechanism # 2.

2a 4-methyl-1,2,3-pentatriene **2b** (4*E*)-2,6-dimethyl-2,4-heptadiene or *trans*-2,6-dimethyl-2,4-heptadiene **2c** (1*Z*)-5-ethyl-1,3,4,5,8-pentamethyl-1-cyclooctene **2d** (1*E*,5*Z*)-1,7-dibromo-2,6-dimethyl-1,5-heptadiene

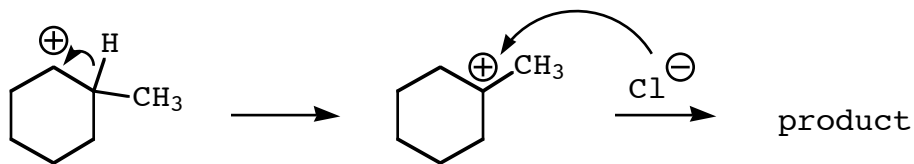
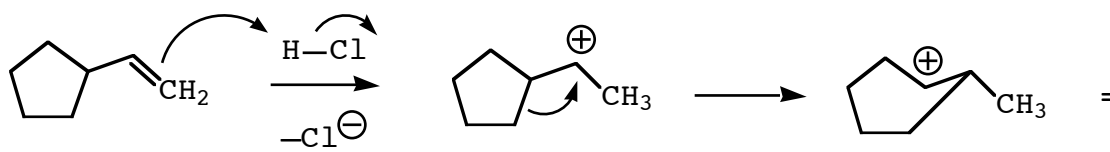
3 3-methyl-1-heptene (4) 3-ethyl-3-hexene (2)

2,3-dimethyl-2-hexene (1) *trans*-2,5-dimethyl-3-hexene (3)

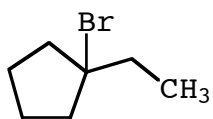
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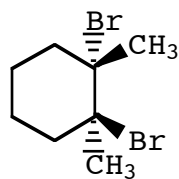
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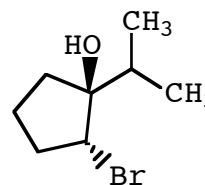
6a



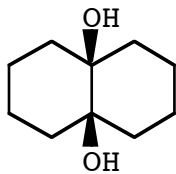
6b



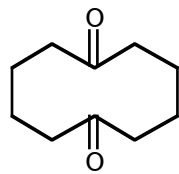
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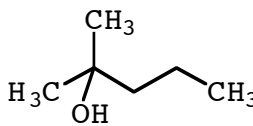
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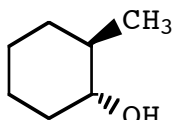
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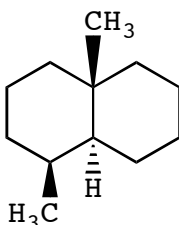
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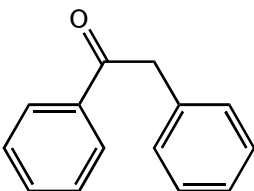
6g



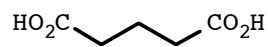
6h



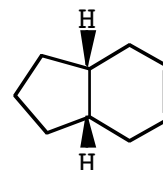
6i



6j



7



8

