

**CBSE Class 11 Chemistry**  
**NCERT Exemplar Solutions**  
**Chapter 6**  
**Thermodynamics**

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**Assertion and Reason Type**

**In the following questions a statement of Assertion (A) followed by a statement of Reason (R) is given. Choose the correct option out of the choices given below each question.**

**55.Assertion (A):** Combustion of all organic compounds is an exothermic reaction.

**Reason (R):** The enthalpies of all elements in their standard state are zero.

- (i) Both A and R are true and R is the correct explanation of A.
- (ii) Both A and R are true but R is not the correct explanation of A.
- (iii) A is true but R is false.
- (iv) A is false but R is true.

**Ans. (ii)**

**Explanation:** In combustion reaction, enthalpy of the reactants is always greater than the enthalpy of the product.

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**56.Assertion (A):** Spontaneous process is an irreversible process and may be reversed by some external agency.

**Reason (R):** Decrease in enthalpy is a contributory factor for spontaneity.

- (i) Both A and R are true and R is the correct explanation of A.
- (ii) Both A and R are true but R is not the correct explanation of A.
- (iii) A is true but R is false.

(iv) A is false but R is true.

**Ans.(ii)**

**Explanation:** For spontaneous process, energy factor should be favourable means  $\Delta H = -ve$  and randomness should be positive.

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**57.Assertion (A):** A liquid crystallises into a solid and is accompanied by decrease in entropy.

**Reason (R):** In crystals, molecules organise in an ordered manner.

(i) Both A and R are true and R is the correct explanation of A.

(ii) Both A and R are true but R is not the correct explanation of A.

(iii) A is true but R is false.

(iv) A is false but R is true.

**Ans.(i)**

**Explanation:** When a liquid crystallizes, its entropy decreases. Since in crystalline form, the molecules are more ordered.