

## (Physical Chemistry)

## Thermochemistry

1. At 25°C and 1 atm pressure, the enthalpies of combustion are as given below:

Substance	H <sub>2</sub>	C(graphite)	C <sub>2</sub> H <sub>6</sub> (g)
$\frac{\Delta_c H^\ominus}{\text{kJ mol}^{-1}}$	-286.0	-394.0	-1560.0

The enthalpy of formation of ethane is

- (1) +54.0 kJ mol<sup>-1</sup> (2) -68.0 kJ mol<sup>-1</sup>  
 (3) -86.0 kJ mol<sup>-1</sup> (4) +97.0 kJ mol<sup>-1</sup>

[JEE Main, June 2022]

2. Enthalpy of sublimation of iodine is 24 cal g<sup>-1</sup> at 200°C. If specific heat of I<sub>2</sub>(s) and I<sub>2</sub>(g) are 0.055 and 0.031 cal g<sup>-1</sup> K<sup>-1</sup> respectively, then enthalpy of sublimation of iodine at 250°C in cal g<sup>-1</sup> is:

- (1) 2.85 (2) 22.8 (3) 11.4 (4) 5.7

[Jee Main, April 2019]

3. The standard enthalpies of formation of Al<sub>2</sub>O<sub>3</sub> and CaO are -1675 kJ mol<sup>-1</sup> and -635 kJ mol<sup>-1</sup> respectively.

For the reaction



(Round off to the Nearest Integer)

[JEE Main, March 2021]

4. The average S-F bond energy in kJ mol<sup>-1</sup> of SF<sub>6</sub> is \_\_\_\_\_. (Rounded off to the nearest integer)  
 [Given : The values of standard enthalpy of formation of SF<sub>6</sub>(g), S(g) and F(g) are -1100, 275 and 80 kJ mol<sup>-1</sup> respectively.]

[JEE Main, Feb 2021]

5. The ionization enthalpy of Na<sup>+</sup> formation from Na(g) is 495.8 kJ mol<sup>-1</sup>, while the electron gain enthalpy of Br is -325.0 kJ mol<sup>-1</sup>. Given the lattice enthalpy of NaBr is -728.4 kJ mol<sup>-1</sup>. The energy for the formation of NaBr ionic solid is (-) \_\_\_\_\_ × 10<sup>-1</sup> kJ mol<sup>-1</sup>.

[JEE Main, Feb 2021]

6. 200 mL of 0.2 M HCl is mixed with 300 mL of 0.1 M NaOH. The molar heat of neutralization of this reaction is -57.1 kJ. The increase in temperature in °C of the system on mixing is x × 10<sup>-2</sup>. The value of x is \_\_\_\_\_. (Nearest integer)

[Given : Specific heat of water = 4.18 J g<sup>-1</sup> K<sup>-1</sup> Density of water = 1.00 g cm<sup>-3</sup>]

(Assume no volume change on mixing)

[JEE Main, August 2021]

## ANSWERS KEY

1. (3) 2. (2) 3. (230) 4. (309) 5. (5576) 6. (82)

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