

CHEMICAL HEAT

TEST _____

Exothermic and Endothermic Reactions

Date: _____

1. I. Sublimation of iodine
II. Burning of a candle
III. Evaporation of alcohol
IV. Melting of tin
Which ones are endothermic processes?
A) I – II B) III – IV C) I – IV D) I – III – IV E) All

2. I. $X_{2(g)} \Rightarrow 2X_{(g)}$
II. $H_2O_{(l)} \Rightarrow H_2O_{(s)}$
III. $Z_{(s)} \Rightarrow Z_{(g)}$
Which ones are exothermic reactions?
A) I B) II C) III D) II-III E) I – II

3. 5.6 g Fe reacts with O_2 to produce Fe_2O_3 and gives 19 kcal heat. What is the enthalpy of formation of Fe_2O_3 ? ($Fe=56$)
A) –190 B) +190 C) –380 D) +380 E) 38

4. 5.9 kcal energy must be given to 9 g of water at 0 °C to become vapor at 100 °C if so, what is ΔH for reaction : $H_2O_{(g)} \Rightarrow H_2O_{(l)}$ ($C_{water}= 1 \text{ cal/g}$, $H_2O = 18 \text{ g/mol}$)
A) +10 B) –10 C) –5 D) +5 E) –10.8

5. The molar enthalpy of burning of C_3H_8 is –480 kcal/mol. What will be the heat change, if 8.8 g C_3H_8 reacts with 11.2 L O_2 at STP?
A) Gives 48 kcal heat
B) Gains 48 kcal heat
C) Gains 24 kcal heat
D) Gives 24 kcal heat
E) Gives 96 kcal heat

6. 14 g CO burns with O_2 and produces 34 kcal of heat. $CO + \frac{1}{2} O_2 \Rightarrow CO_2$ $\Delta H = ?$ What is the ΔH of the reaction given?
A) –34 B) +34 C) –68 D) +68 E) –136

7. $X_{(s)} + H_2O_{(s)} \Rightarrow XOH_{(g)} + \frac{1}{2} H_{2(g)}$ $\Delta H = -64 \text{ kcal}$. m gram X is reacted with H_2O and gives 32 kcal heat. According to given data, what is the atomic mass number of X?
A) m B) 2m C) 4m D) 5m E) 10m

8. Neutralization of 1M 200ml H_2SO_4 solution by KOH gives 5.6 kcal heat. What is molar heat at neutralization for H_2SO_4 ?
A) –14 B) +14 C) –28 D) –56 E) +28

9. If the sum of heat contents is smaller then the sum of products heat contents, then:
I. $\Delta H > 0$
II. Exothermic reaction
III. Reaction gives heat.
Which one(s) is (are) correct?
A) I B) II C) II-III D) III E) I – II

10. $C_3H_4 + 4O_2 \Rightarrow 3CO_2 + 2H_2O + 440 \text{ kcal}$ According to the given reaction
I. $\Delta H = -440 \text{ kcal}$
II. 0.6 mol CO_2 is produced when we can get 88 kcal heat.
III. The molar heat of burning of C_3H_4 is 440 kcal/mol.
Which one(s) is(are) correct combustion?
A) I B) III C) II-III D) I-III E) II-III

11. $C_2H_4 + H_2 \Rightarrow C_2H_6$ $\Delta H = -20 \text{ kcal/mol}$
 $C_2H_2 + 2H_2 \Rightarrow C_2H_6$ $\Delta H = -30 \text{ kcal/mol}$
If the mixture of 5 mol C_2H_4 and C_2H_2 produces 130 kcal heat. What is the mol number of C_2H_2 ?
A) 1 B) 2 C) 3 D) 4 E) 5