Enthalpy Change

Apprentice Difficulty Level
Question Group 1
Question 1

The ΔH for the following reaction is -88 kJ.

$$PCl_{3(g)} + Cl_{2(g)} \rightarrow PCl_{5(g)}$$

Determine the ΔH (in kJ) for the related reactions below. (Give attention to the +/- sign).

$2\ PCl_{3(g)} + 2\ Cl_{2(g)} \rightarrow 2\ PCl_{5(g)}$)

$PCl_{5(g)} \rightarrow PCl_{3(g)} + Cl_{2(g)}$

$3\ PCl_{5(g)} \rightarrow 3\ PCl_{3(g)} + 3\ Cl_{2(g)}$

$5\ PCl_{3(g)} + 5\ Cl_{2(g)} \rightarrow 5\ PCl_{5(g)}$

Question 2

The ΔH for the following reaction is -342 kJ.

$$Fe_{(s)} + Cl_{2(g)} \rightarrow FeCl_{2(s)}$$

Determine the ΔH (in kJ) for the related reactions below. (Give attention to the +/- sign).

$2\ Fe_{(s)} + 2\ Cl_{2(g)} \rightarrow 2\ FeCl_{2(s)}$

$FeCl_{2(s)} \rightarrow Fe_{(s)} + Cl_{2(g)}$

$3\ FeCl_{2(s)} \rightarrow 3\ Fe_{(s)} + 3\ Cl_{2(g)}$

$5\ Fe_{(s)} + 5\ Cl_{2(g)} \rightarrow 5\ FeCl_{2(s)}$

Question 3

The ΔH for the following reaction is -394 kJ.

$$C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$$

Determine the ΔH (in kJ) for the related reactions below. (Give attention to the +/- sign).

$2\ C_{(s)} + 2\ O_{2(g)} \rightarrow 2\ CO_{2(g)}$

$CO_{2(g)} \rightarrow C_{(s)} + O_{2(g)}$

$3\ CO_{2(g)} \rightarrow 3\ C_{(s)} + 3\ O_{2(g)}$

$5\ C_{(s)} + 5\ O_{2(g)} \rightarrow 5\ CO_{2(g)}$

Question Group 2
Question 4

The ΔH for the following reaction is -570 kJ.

$$2\ H_{2(g)} + O_{2(g)} \rightarrow 2\ H_2O_{(l)}$$

Determine the ΔH (in kJ) for the related reactions below. (Give attention to the +/- sign).

$6\ H_{2(g)} + 3\ O_{2(g)} \rightarrow 6\ H_2O_{(l)}$

$4\ H_2O_{(l)} \rightarrow 4\ H_{2(g)} + 2\ O_{2(g)}$

$4\ H_{2(g)} + 2\ O_{2(g)} \rightarrow 4\ H_2O_{(l)}$

$6\ H_2O_{(l)} \rightarrow 6\ H_{2(g)} + 3\ O_{2(g)}$

Question 5
The ΔH for the following reaction is -565 kJ.

$$2\ CO_{(g)} + O_{2(g)} \rightarrow 2\ CO_{2(g)}$$

Determine the ΔH (in kJ) for the related reactions below. (Give attention to the +/- sign).
$6\ CO_{(g)} + 3\ O_{2(g)} \rightarrow 6\ CO_{2(g)}$
$4\ CO_{2(g)} \rightarrow 4\ CO_{(g)} + 2\ O_{2(g)}$
$4\ CO_{(g)} + 2\ O_{2(g)} \rightarrow 4\ CO_{2(g)}$
$6\ CO_{2(g)} \rightarrow 6\ CO_{(g)} + 3\ O_{2(g)}$

Question 6
The ΔH for the following reaction is -537 kJ.

$$H_{2(g)} + F_{2(g)} \rightarrow 2\ HF_{(g)}$$

Determine the ΔH (in kJ) for the related reactions below. (Give attention to the +/- sign).
$3\ H_{2(g)} + 3\ F_{2(g)} \rightarrow 6\ HF_{(g)}$
$4\ HF_{(g)} \rightarrow 2\ H_{2(g)} + 2\ F_{2(g)}$
$2\ H_{2(g)} + 2\ F_{2(g)} \rightarrow 4\ HF_{(g)}$
$6\ HF_{(g)} \rightarrow 3\ H_{2(g)} + 3\ F_{2(g)}$

Question Group 3
Question 7
The ΔH for the following reaction is 180 kJ.

$$N_{2(g)} + O_{2(g)} \rightarrow 2\ NO_{(g)}$$

Determine the ΔH (in kJ) for the related reactions below. (Give attention to the +/- sign).
$4\ N_{2(g)} + 4\ O_{2(g)} \rightarrow 8\ NO_{(g)}$
$4\ NO_{(g)} \rightarrow 2\ N_{2(g)} + 2\ O_{2(g)}$
$6\ NO_{(g)} \rightarrow 3\ N_{2(g)} + 3\ O_{2(g)}$
$2\ N_{2(g)} + 2\ O_{2(g)} \rightarrow 4\ NO_{(g)}$

Question 8
The ΔH for the following reaction is 566 kJ.

$$2\ CO_{2(g)} \rightarrow 2\ CO_{(g)} + O_{2(g)}$$

Determine the ΔH (in kJ) for the related reactions below. (Give attention to the +/- sign).
$8\ CO_{2(g)} \rightarrow 8\ CO_{(g)} + 4\ O_{2(g)}$
$4\ CO_{(g)} + 2\ O_{2(g)} \rightarrow 4\ CO_{2(g)}$
$6\ CO_{(g)} + 3\ O_{2(g)} \rightarrow 6\ CO_{2(g)}$
$4\ CO_{2(g)} \rightarrow 4\ CO_{(g)} + 2\ O_{2(g)}$

Question 9
The ΔH for the following reaction is -1686 kJ.

$$2\ W_{(s)} + 3\ O_{2(g)} \rightarrow 2\ WO_{3(s)}$$

Determine the ΔH (in kJ) for the related reactions below. (Give attention to the +/- sign).
$8\ W_{(s)} + 12\ O_{2(g)} \rightarrow 8\ WO_{3(s)}$
$4\ WO_{3(s)} \rightarrow 4\ W_{(s)} + 6\ O_{2(g)}$
$6\ WO_{3(s)} \rightarrow 6\ W_{(s)} + 9\ O_{2(g)}$
$4\ W_{(s)} + 6\ O_{2(g)} \rightarrow 4\ WO_{3(s)}$

Question Group 4
Question 10
The ΔH values for three chemical equations is shown. Adjust the equation so that the energy term (kJ) is located in the equation. Locate it on either the reactant or the product side.

$PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$ $\quad \Delta H = +88$ kJ
$Fe_{(s)} + Cl_{2(s)} \longrightarrow FeCl_{2(s)}$ $\quad \Delta H = -341.8$kJ
$C_{(s)} + O_{2(g)} \longrightarrow CO_{2(g)}$ $\quad \Delta H = -393.5$ kJ

Question 11
The ΔH values for three chemical equations is shown. Adjust the equation so that the energy term (kJ) is located in the equation. Locate it on either the reactant or the product side.

$C_{(s)} + O_{2(g)} \longrightarrow CO_{2(g)}$ $\quad \Delta H = -393.5$ kJ
$PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$ $\quad \Delta H = +88$ kJ
$Fe_{(s)} + Cl_{2(s)} \longrightarrow FeCl_{2(s)}$ $\quad \Delta H = -341.8$kJ

Question 12
The ΔH values for three chemical equations is shown. Adjust the equation so that the energy term (kJ) is located in the equation. Locate it on either the reactant or the product side.

$Fe_{(s)} + Cl_{2(s)} \longrightarrow FeCl_{2(s)}$ $\quad \Delta H = -341.8$kJ
$C_{(s)} + O_{2(g)} \longrightarrow CO_{2(g)}$ $\quad \Delta H = -393.5$ kJ
$PCl_5(g) \rightarrow PCl_3(g) + Cl_2(g)$ $\quad \Delta H = +88$ kJ

Question Group 5
Question 13
The ΔH values for three chemical equations is shown. Adjust the equation so that the energy term (kJ) is located in the equation. Locate it on either the reactant or the product side.

$2\ H_{2(g)} + O_{2(g)} \rightarrow 2\ H_2O_{(l)}$ $\quad \Delta H = -570$ kJ
$2\ CO_2(g) \rightarrow 2\ CO(g) + O_2(g)$ $\quad \Delta H = +565$ kJ

$H_{2(g)} + F_{2(g)} \rightarrow 2\ HF_{(g)}$ $\Delta H = -537kJ$

Question 14

The ΔH values for three chemical equations is shown. Adjust the equation so that the energy term (kJ) is located in the equation. Locate it on either the reactant or the product side.

$H_{2(g)} + F_{2(g)} \rightarrow 2\ HF_{(g)}$ $\Delta H = -537kJ$

$2\ H_{2(g)} + O_{2(g)} \rightarrow 2\ H_2O_{(l)}$ $\Delta H = -570\ kJ$

$2\ CO_2(g) \rightarrow 2\ CO(g) + O_2(g)$ $\Delta H = +565\ kJ$

Question 15

The ΔH values for three chemical equations is shown. Adjust the equation so that the energy term (kJ) is located in the equation. Locate it on either the reactant or the product side.

$2\ CO_2(g) \rightarrow 2\ CO(g) + O_2(g)$ $\Delta H = +565\ kJ$

$H_{2(g)} + F_{2(g)} \rightarrow 2\ HF_{(g)}$ $\Delta H = -537kJ$

$2\ H_{2(g)} + O_{2(g)} \rightarrow 2\ H_2O_{(l)}$ $\Delta H = -570\ kJ$

Question Group 6

Question 16

The ΔH values for three chemical equations is shown. Adjust the equation so that the energy term (kJ) is located in the equation. Locate it on either the reactant or the product side.

$N_{2(g)} + O_{2(g)} \rightarrow 2\ NO_{(g)}$ $\Delta H = 180\ kJ$

$2\ CO_{2(g)} \longrightarrow 2\ CO_{(g)} + O_{2(g)}$ $\Delta H = +566.0\ kJ$

$2\ W_{(s)} + 3\ O_{2(g)} \longrightarrow 2\ WO_{3(s)}$ $\Delta H = -1686\ kJ$

Question 17

The ΔH values for three chemical equations is shown. Adjust the equation so that the energy term (kJ) is located in the equation. Locate it on either the reactant or the product side.

$2\ W_{(s)} + 3\ O_{2(g)} \longrightarrow 2\ WO_{3(s)}$ $\Delta H = -1686\ kJ$

$N_{2(g)} + O_{2(g)} \rightarrow 2\ NO_{(g)}$ $\Delta H = 180\ kJ$

$2\ CO_{2(g)} \longrightarrow 2\ CO_{(g)} + O_{2(g)}$ $\Delta H = +566.0\ kJ$

Question 18

The ΔH values for three chemical equations is shown. Adjust the equation so that the energy term (kJ) is located in the equation. Locate it on either the reactant or the product side.

$2\ CO_{2(g)} \longrightarrow 2\ CO_{(g)} + O_{2(g)}$ $\Delta H = +566.0\ kJ$

$2\ W_{(s)} + 3\ O_{2(g)} \longrightarrow 2\ WO_{3(s)}$ $\Delta H = -1686\ kJ$

$N_{2(g)} + O_{2(g)} \rightarrow 2\ NO_{(g)}$ $\Delta H = 180$ kJ

Master Difficulty Level

Question Group 7

Question 19

Students are studying the reaction: $2\ H_{2(g)} + O_{2(g)} \longrightarrow 2\ H_2O_{(l)}$

Their calorimetry methods indicate that 61 kJ of heat is released to the surroundings when 0.250 mol of H_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$2\ H_{2(g)} + O_{2(g)} \longrightarrow 2\ H_2O_{(l)}$ $\Delta H =$ _____ kJ

$4\ H_{2(g)} + 2\ O_{2(g)} \longrightarrow 4\ H_2O_{(l)}$ $\Delta H =$ _____ kJ

$6\ H_{2(g)} + 3\ O_{2(g)} \longrightarrow 6\ H_2O_{(l)}$ $\Delta H =$ _____ kJ

Question 20

Students are studying the reaction: $2\ H_{2(g)} + O_{2(g)} \longrightarrow 2\ H_2O_{(l)}$

Their calorimetry methods indicate that 121 kJ of heat is released to the surroundings when 0.500 mol of H_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$2\ H_{2(g)} + O_{2(g)} \longrightarrow 2\ H_2O_{(l)}$ $\Delta H =$ _____ kJ

$4\ H_{2(g)} + 2\ O_{2(g)} \longrightarrow 4\ H_2O_{(l)}$ $\Delta H =$ _____ kJ

$6\ H_{2(g)} + 3\ O_{2(g)} \longrightarrow 6\ H_2O_{(l)}$ $\Delta H =$ _____ kJ

Question 21

Students are studying the reaction: $2\ H_{2(g)} + O_{2(g)} \longrightarrow 2\ H_2O_{(l)}$

Their calorimetry methods indicate that 968 kJ of heat is released to the surroundings when 2.00 mol of O_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$2\ H_{2(g)} + O_{2(g)} \longrightarrow 2\ H_2O_{(l)}$ $\Delta H =$ _____ kJ

$4\ H_{2(g)} + 2\ O_{2(g)} \longrightarrow 4\ H_2O_{(l)}$ $\Delta H =$ _____ kJ

$6\ H_{2(g)} + 3\ O_{2(g)} \longrightarrow 6\ H_2O_{(l)}$ $\Delta H =$ _____ kJ

Question Group 8

Question 22

Students are studying the reaction: $N_{2(g)} + 3\ H_{2(g)} \longrightarrow 2\ NH_{3(g)}$

Their calorimetry methods indicate that 23 kJ of heat is released to the surroundings when 0.250 mol of N_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$N_{2(g)} + 3\ H_{2(g)} \longrightarrow 2\ NH_{3(g)}$ $\Delta H =$ _____ kJ

$2\ N_{2(g)} + 6\ H_{2(g)} \longrightarrow 4\ NH_{3(g)}$ $\Delta H =$ _____ kJ

$3\ N_{2(g)} + 9\ H_{2(g)} \longrightarrow 6\ NH_{3(g)}$ $\Delta H =$ _____ kJ

Question 23

Students are studying the reaction: $N_{2(g)} + 3\ H_{2(g)} \longrightarrow 2\ NH_{3(g)}$

Their calorimetry methods indicate that 46 kJ of heat is released to the surroundings when 0.500 mol of N_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$N_{2(g)} + 3\ H_{2(g)} \longrightarrow 2\ NH_{3(g)}$ $\Delta H =$ _____ kJ

$2\ N_{2(g)} + 6\ H_{2(g)} \longrightarrow 4\ NH_{3(g)}$ $\Delta H =$ _____ kJ
$3\ N_{2(g)} + 9\ H_{2(g)} \longrightarrow 6\ NH_{3(g)}$ $\Delta H =$ _____ kJ

Question 24

Students are studying the reaction: $N_{2(g)} + 3\ H_{2(g)} \longrightarrow 2\ NH_{3(g)}$
Their calorimetry methods indicate that 46 kJ of heat is released to the surroundings when 1.50 mol of H_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$N_{2(g)} + 3\ H_{2(g)} \longrightarrow 2\ NH_{3(g)}$ $\Delta H =$ _____ kJ
$2\ N_{2(g)} + 6\ H_{2(g)} \longrightarrow 4\ NH_{3(g)}$ $\Delta H =$ _____ kJ
$3\ N_{2(g)} + 9\ H_{2(g)} \longrightarrow 6\ NH_{3(g)}$ $\Delta H =$ _____ kJ

Question Group 9

Question 25

Students are studying the reaction: $2\ WO_{2(s)} + O_{2(g)} \longrightarrow 2\ WO_{3(s)}$
Their calorimetry methods indicate that 63 kJ of heat is released to the surroundings when 0.250 mol of WO_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$2\ WO_{2(s)} + O_{2(g)} \longrightarrow 2\ WO_{3(s)}$ $\Delta H =$ _____ kJ
$4\ WO_{2(s)} + 2\ O_{2(g)} \longrightarrow 4\ WO_{3(s)}$ $\Delta H =$ _____ kJ
$6\ WO_{2(s)} + 3\ O_{2(g)} \longrightarrow 6\ WO_{3(s)}$ $\Delta H =$ _____ kJ

Question 26

Students are studying the reaction: $2\ WO_{2(s)} + O_{2(g)} \longrightarrow 2\ WO_{3(s)}$
Their calorimetry methods indicate that 126 kJ of heat is released to the surroundings when 0.500 mol of WO_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$2\ WO_{2(s)} + O_{2(g)} \longrightarrow 2\ WO_{3(s)}$ $\Delta H =$ _____ kJ
$4\ WO_{2(s)} + 2\ O_{2(g)} \longrightarrow 4\ WO_{3(s)}$ $\Delta H =$ _____ kJ
$6\ WO_{2(s)} + 3\ O_{2(g)} \longrightarrow 6\ WO_{3(s)}$ $\Delta H =$ _____ kJ

Question 27

Students are studying the reaction: $2\ WO_{2(s)} + O_{2(g)} \longrightarrow 2\ WO_{3(s)}$
Their calorimetry methods indicate that 1010 kJ of heat is released to the surroundings when 2.00 mol of O_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$2\ WO_{2(s)} + O_{2(g)} \longrightarrow 2\ WO_{3(s)}$ $\Delta H =$ _____ kJ
$4\ WO_{2(s)} + 2\ O_{2(g)} \longrightarrow 4\ WO_{3(s)}$ $\Delta H =$ _____ kJ
$6\ WO_{2(s)} + 3\ O_{2(g)} \longrightarrow 6\ WO_{3(s)}$ $\Delta H =$ _____ kJ

Question Group 10

Question 28

Students are studying the reaction: $H_{2(g)} + Cl_{2(g)} \longrightarrow 2\ HCl_{(g)}$

Their calorimetry methods indicate that 92 kJ of heat is released to the surroundings when 0.50 mol of H_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$H_{2(g)} + Cl_{2(g)} \longrightarrow 2\ HCl_{(g)}$ $\Delta H =$ _____ kJ
$2\ H_{2(g)} + 2\ Cl_{2(g)} \longrightarrow 4\ HCl_{(g)}$ $\Delta H =$ _____ kJ
$4\ H_{2(g)} + 4\ Cl_{2(g)} \longrightarrow 8\ HCl_{(g)}$ $\Delta H =$ _____ kJ

Question 29

Students are studying the reaction: $H_{2(g)} + Cl_{2(g)} \longrightarrow 2\ HCl_{(g)}$
Their calorimetry methods indicate that 46 kJ of heat is released to the surroundings when 0.250 mol of H_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$H_{2(g)} + Cl_{2(g)} \longrightarrow 2\ HCl_{(g)}$ $\Delta H =$ _____ kJ
$2\ H_{2(g)} + 2\ Cl_{2(g)} \longrightarrow 4\ HCl_{(g)}$ $\Delta H =$ _____ kJ
$4\ H_{2(g)} + 4\ Cl_{2(g)} \longrightarrow 8\ HCl_{(g)}$ $\Delta H =$ _____ kJ

Question 30

Students are studying the reaction: $H_{2(g)} + Cl_{2(g)} \longrightarrow 2\ HCl_{(g)}$
Their calorimetry methods indicate that 368 kJ of heat is released to the surroundings when 2.00 mol of Cl_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$H_{2(g)} + Cl_{2(g)} \longrightarrow 2\ HCl_{(g)}$ $\Delta H =$ _____ kJ
$2\ H_{2(g)} + 2\ Cl_{2(g)} \longrightarrow 4\ HCl_{(g)}$ $\Delta H =$ _____ kJ
$4\ H_{2(g)} + 4\ Cl_{2(g)} \longrightarrow 8\ HCl_{(g)}$ $\Delta H =$ _____ kJ

Question Group 11

Question 31

Students are studying the reaction: $PCl_{5(g)} \longrightarrow PCl_{3(g)} + Cl_{2(g)}$
Their calorimetry methods indicate that 22 kJ of heat is absorbed from the surroundings when 0.250 mol of PCl_5 reacts. Use their data to determine the enthalpy change of the three given reactions.

$PCl_{5(g)} \longrightarrow PCl_{3(g)} + Cl_{2(g)}$ $\Delta H =$ _____ kJ
$3\ PCl_{5(g)} \longrightarrow 3\ PCl_{3(g)} + 3\ Cl_{2(g)}$ $\Delta H =$ _____ kJ
$5\ PCl_{5(g)} \longrightarrow 5\ PCl_{3(g)} + 5\ Cl_{2(g)}$ $\Delta H =$ _____ kJ

Question 32

Students are studying the reaction: $PCl_{5(g)} \longrightarrow PCl_{3(g)} + Cl_{2(g)}$
Their calorimetry methods indicate that 44 kJ of heat is absorbed from the surroundings when 0.500 mol of PCl_5 reacts. Use their data to determine the enthalpy change of the three given reactions.

$PCl_{5(g)} \longrightarrow PCl_{3(g)} + Cl_{2(g)}$ $\Delta H =$ _____ kJ
$3\ PCl_{5(g)} \longrightarrow 3\ PCl_{3(g)} + 3\ Cl_{2(g)}$ $\Delta H =$ _____ kJ
$5\ PCl_{5(g)} \longrightarrow 5\ PCl_{3(g)} + 5\ Cl_{2(g)}$ $\Delta H =$ _____ kJ

Question 33

Students are studying the reaction: $PCl_{5(g)} \longrightarrow PCl_{3(g)} + Cl_{2(g)}$
Their calorimetry methods indicate that 176 kJ of heat is absorbed from the surroundings when 2.00 mol of PCl_5 reacts. Use their data to determine the enthalpy change of the three given reactions.

$PCl_{5(g)} \longrightarrow PCl_{3(g)} + Cl_{2(g)}$ $\Delta H =$ _____ kJ
$3\ PCl_{5(g)} \longrightarrow 3\ PCl_{3(g)} + 3\ Cl_{2(g)}$ $\Delta H =$ _____ kJ
$5\ PCl_{5(g)} \longrightarrow 5\ PCl_{3(g)} + 5\ Cl_{2(g)}$ $\Delta H =$ _____ kJ

Question Group 12

Question 34

Students are studying the reaction: $C_{(s)} + 2\ F_{2(g)} \longrightarrow CF_{4(g)}$
Their calorimetry methods indicate that 340 kJ of heat is released to the surroundings when 0.500 mol of C reacts. Use their data to determine the enthalpy change of the three given reactions.

$C_{(s)} + 2\ F_{2(g)} \longrightarrow CF_{4(g)}$ $\Delta H =$ _____ kJ
$2\ C_{(s)} + 4\ F_{2(g)} \longrightarrow 2\ CF_{4(g)}$ $\Delta H =$ _____ kJ
$5\ C_{(s)} + 10\ F_{2(g)} \longrightarrow 5\ CF_{4(g)}$ $\Delta H =$ _____ kJ

Question 35

Students are studying the reaction: $C_{(s)} + 2\ F_{2(g)} \longrightarrow CF_{4(g)}$
Their calorimetry methods indicate that 170 kJ of heat is released to the surroundings when 0.500 mol of F_2 reacts. Use their data to determine the enthalpy change of the three given reactions.

$C_{(s)} + 2\ F_{2(g)} \longrightarrow CF_{4(g)}$ $\Delta H =$ _____ kJ
$2\ C_{(s)} + 4\ F_{2(g)} \longrightarrow 2\ CF_{4(g)}$ $\Delta H =$ _____ kJ
$5\ C_{(s)} + 10\ F_{2(g)} \longrightarrow 5\ CF_{4(g)}$ $\Delta H =$ _____ kJ

Question 36

Students are studying the reaction: $C_{(s)} + 2\ F_{2(g)} \longrightarrow CF_{4(g)}$
Their calorimetry methods indicate that 1360 kJ of heat is released to the surroundings when 2.00 mol of C reacts. Use their data to determine the enthalpy change of the three given reactions.

$C_{(s)} + 2\ F_{2(g)} \longrightarrow CF_{4(g)}$ $\Delta H =$ _____ kJ
$2\ C_{(s)} + 4\ F_{2(g)} \longrightarrow 2\ CF_{4(g)}$ $\Delta H =$ _____ kJ
$5\ C_{(s)} + 10\ F_{2(g)} \longrightarrow 5\ CF_{4(g)}$ $\Delta H =$ _____ kJ

Wizard Difficulty Level
Question Group 13
Question 37

Students are studying the reaction: $N_{2(g)} + 3\ H_{2(g)} \longrightarrow 2\ NH_{3(g)}$
Their calorimetry methods indicate that 46.0 kJ of heat is released to the surroundings when 14.0 grams of N_2 reacts. Use their data to determine the moles of reactant and the enthalpy change (in kJ) of the given reaction. Include the proper +/- sign on ΔH.

moles of reactant:-_____

ΔH = _____ kJ

Question 38

Students are studying the reaction: $N_{2(g)} + 3\ H_{2(g)} \longrightarrow 2\ NH_{3(g)}$
Their calorimetry methods indicate that 46.0 kJ of heat is released to the surroundings when 3.00 grams of H_2 reacts. Use their data to determine the moles of reactant and the enthalpy change (in kJ) of the given reaction. Include the proper +/- sign on ΔH.

moles of reactant:-_____

ΔH = _____ kJ

Question 39

Students are studying the reaction: $N_{2(g)} + 3\ H_{2(g)} \longrightarrow 2\ NH_{3(g)}$
Their calorimetry methods indicate that 184 kJ of heat is released to the surroundings when 12.0 grams of N_2 reacts. Use their data to determine the moles of reactant and the enthalpy change (in kJ) of the given reaction. Include the proper +/- sign on ΔH.

moles of reactant:-_____

ΔH = _____ kJ

Question Group 14
Question 40

Students are studying the reaction: $C_{(s)} + 2\ F_{2(g)} \longrightarrow CF_{4(g)}$
Their calorimetry methods indicate that 340 kJ of heat is released to the surroundings when 0.500 grams of C reacts. Use their data to determine the moles of reactant and the enthalpy change (in kJ) of the given reaction. Include the proper +/- sign on ΔH.

moles of reactant:-_____

ΔH = _____ kJ

Question 41

Students are studying the reaction: $C_{(s)} + 2\ F_{2(g)} \longrightarrow CF_{4(g)}$
Their calorimetry methods indicate that 170 kJ of heat is released to the surroundings when 0.500 grams of F_2 reacts. Use their data to determine the moles of reactant and the enthalpy change (in kJ) of the given reaction. Include the proper +/- sign on ΔH.

moles of reactant:-_____

ΔH = _____ kJ

Question 42

Students are studying the reaction: $C_{(s)} + 2\ F_{2(g)} \longrightarrow CF_{4(g)}$
Their calorimetry methods indicate that 340 kJ of heat is released to the surroundings when 1.00 grams of F_2 reacts. Use their data to determine the moles of reactant and the enthalpy change (in kJ) of the given reaction. Include the proper +/- sign on ΔH.

moles of reactant:-_____

ΔH = _____ kJ

Question Group 15

Question 43

Students are studying the reaction: $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$
Their calorimetry methods indicate that 197 kJ of heat is released to the surroundings when 6.00 grams of C reacts. Use their data to determine the moles of reactant and the enthalpy change (in kJ) of the given reaction. Include the proper +/- sign on ΔH.

moles of reactant:-_____

ΔH = _____ kJ

Question 44

Students are studying the reaction: $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$
Their calorimetry methods indicate that 98.5 kJ of heat is released to the surroundings when 8.00 grams of O_2 reacts. Use their data to determine the moles of reactant and the enthalpy change (in kJ) of the given reaction. Include the proper +/- sign on ΔH.

moles of reactant:-_____

ΔH = _____ kJ

Question 45

Students are studying the reaction: $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$
Their calorimetry methods indicate that 197 kJ of heat is released to the surroundings when 16.0 grams of O_2 reacts. Use their data to determine the moles of reactant and the enthalpy change (in kJ) of the given reaction. Include the proper +/- sign on ΔH.

moles of reactant:-_____

ΔH = _____ kJ