

An ideal gas is compressed from 6 L to 4 L at constant temperature and external pressure of 5 atm. How much work (in atm.L) is done on the gas?

A) -10

☒ B) +10

C) -30

D) +30

$$\begin{aligned} W &= -P\Delta V \\ W &= -5 \times (4 - 6) \\ &= +10 \text{ atm.L} \end{aligned}$$

If the internal energy of a system increased in by 80 J and has 50 J of work done on it, the heat change of the system (in J) is:

A) -130

☒ (B) +30

C) +130

D) -30

$$\Delta E = q + w$$

$$w = +50 \text{ J}$$

$$80 = q + 50$$

$$q = 80 - 50 = +30 \text{ J}$$

If a 100 g of water cools from 25°C and release 1.25 kJ as a heat. What is the final temperature of the water? (specific heat of water (s) = 4.18 J/g.°C)

A) 18

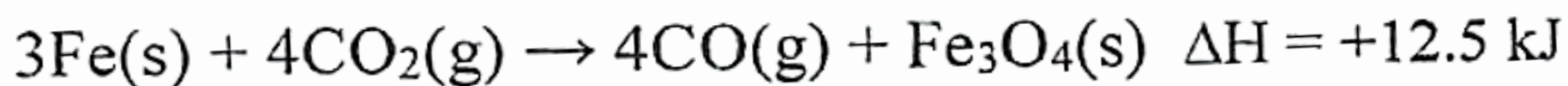
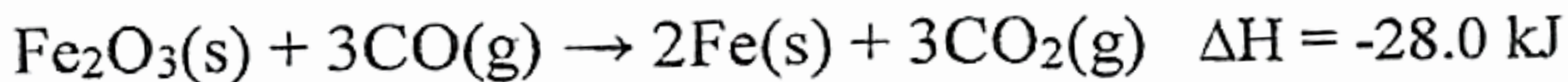
B) 3

☒ C) 22

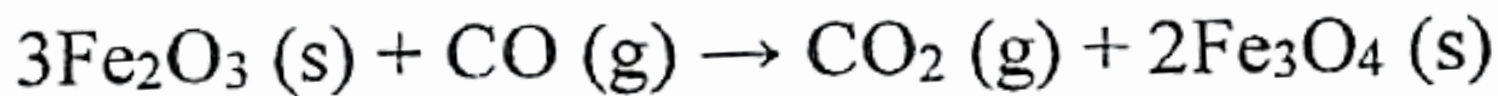
D) 11

$$\begin{aligned} q &= ms \Delta t \\ -1250 &= 100 \times 4.18 \times (T_2 - 25) \\ T_2 &= 25 - 3 = 22^\circ\text{C} \end{aligned}$$

Given the following reactions



the enthalpy of the following reaction in (kJ) is:



A) +59

B) +109

Hess law

C) - 109

(D) - 59

Given the following information:

Thermochemical Reaction	ΔH° (in kJ)
$\text{Na(s)} + \text{H}_2\text{O(l)} \rightarrow \text{NaOH(s)} + 1/2\text{H}_2\text{(g)}$	-146
$\text{Na}_2\text{SO}_4\text{(s)} + \text{H}_2\text{O(l)} \rightarrow 2\text{NaOH(s)} + \text{SO}_3\text{(g)}$	+418
$2\text{Na}_2\text{O(s)} + 2\text{H}_2\text{(g)} \rightarrow 4\text{Na(s)} + 2\text{H}_2\text{O(l)}$	+259

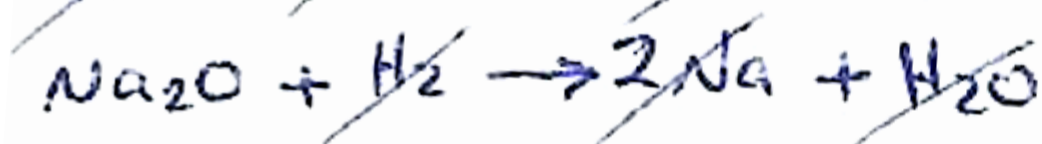
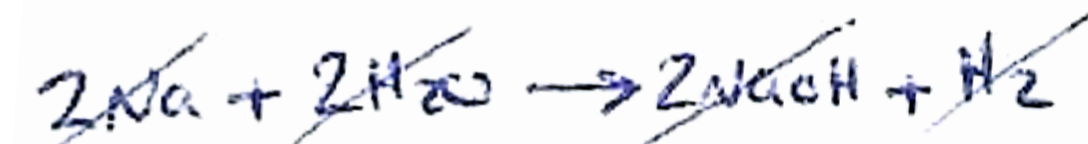
The change in enthalpy of the following reaction (in $\text{kJ}\cdot\text{mol}^{-1}$) is: $\text{Na}_2\text{O(s)} + \text{SO}_3\text{(g)} \rightarrow \text{Na}_2\text{SO}_4\text{(s)}$

A) +531

☒ B) -581

C) +255

D) -435

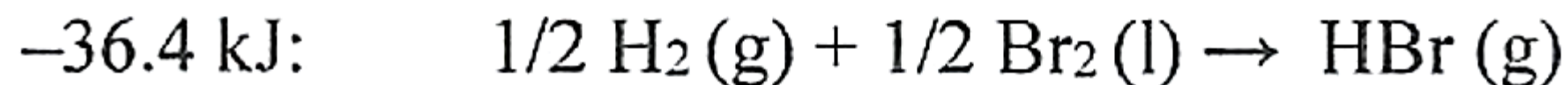


$$2(-146) = -292$$

$$259/2 = 129.5$$

$$-418$$

The ΔH° for the following reaction at 298 K is



The internal energy change " ΔE° " (in kJ), is:

A) −37.6

B) −35.2

C) −36.4

D) −38.6

$$\Delta E = \Delta H - RT\Delta n$$
$$\Delta n = 1 - \frac{1}{2} = \frac{1}{2}$$

Calculate ΔH° for the following reaction (in kJ/mol) at 25°C:

	$\text{Fe}_3\text{O}_4(\text{s}) + \text{CO}(\text{g}) \rightarrow 3\text{FeO}(\text{s}) + \text{CO}_2(\text{g})$			
ΔH_f° (kJ/mol)	-1118	-110.5	-272	-393.5

A) -50

(B) + 19

$$\Delta H_{\text{rxn}} = \sum \Delta H_f^\circ \text{ products} - \sum \Delta H_f^\circ \text{ reactants}$$

C) -263

D) +109

The value of ΔE for a system that performs 23 kJ of work on its surroundings and loses 79 kJ of heat is _____ kJ

(A) - 102

C) - 79

B) +102

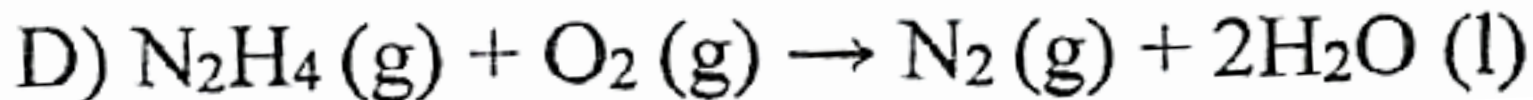
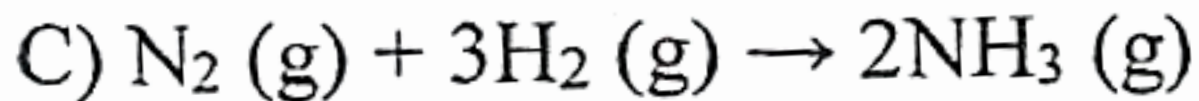
D) +23

$$\Delta E = q + w$$

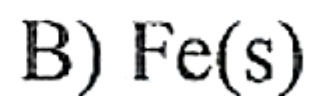
$$w = -23 \text{ kJ}$$

$$q = -79 \text{ kJ}$$

Which of the following reaction has $\Delta H = \Delta E$?



All of the following has a standard heat of formation (ΔH°_f) value of zero **except**:



A gas is compressed in a cylinder from a volume of 20.0 L to 2.0 L by a constant pressure of 10.0 atm.

Calculate the amount of work done in "J"?

A) -1.82×10^4

☒ (B) 1.82×10^4

C) -1.01×10^4

D) 1.01×10^4

$$w = -P\Delta V$$

$$V_1 = 20 \text{ L}$$

$$V_2 = 2 \text{ L}$$

$$1 \text{ L}\cdot\text{atm} = 101.3 \text{ J}$$