1. (3 points) Find the oxidation number of the underlined element in each of the following species.

\[ \text{NH}_4^+ \quad \text{P}_5 \quad \text{H}_3\text{PO}_4 \]

2. (2 points) A particular substance has a specific heat capacity of 2.0 J/mol·°C. How much heat would have to be added to a 10.0-g sample to increase its temperature from 25.0 °C to 35.0 °C?

3. (3 points) A particular substance has a specific heat capacity of 2.0 J/mol·°C. If 40 J of heat were added to a 10.0-g sample of this substance, how much would the temperature change?

4. (2 points) Which one of the following represents a formation reaction used to define the standard enthalpy of formation? Circle the correct answer.

a. \[ 2 \text{P(s)} + 3 \text{Cl}_2 (g) \rightarrow 2 \text{PCl}_3 (g) \]

b. \[ \text{HCl(aq)} + \text{AgNO}_3 (aq) \rightarrow \text{HNO}_3 (aq) + \text{AgCl (s)} \]

c. \[ 3 \text{Ba(s)} + \text{N}_2 (g) \rightarrow \text{Ba}_3\text{N}_2 (s) \]

d. \[ \text{P}_2\text{O}_5 (g) \rightarrow 2 \text{P(s)} + \frac{5}{2} \text{O}_2 (g) \]

\[ q = C_s \times m \times \Delta T \]
1. (3 points) Find the oxidation number of the underlined element in each of the following species.

\[ \text{NH}_4^+ \quad \text{PI}_3 \quad \text{H}_3\text{PO}_3 \]

2. (2 points) A particular substance has a specific heat capacity of 3.0 J/mol°C. How much heat would have to be added to a 20.0-g sample to increase its temperature from 25.0 °C to 35.0 °C?

3. (3 points) A particular substance has a specific heat capacity of 3.0 J/mol°C. If 90 J of heat were added to a 10.0-g sample of this substance, how much would the temperature change?

4. (2 points) Which one of the following represents a formation reaction used to define the standard enthalpy of formation? Circle the correct answer.

a. \[ 3 \text{ Ca(s)} + \text{ N}_2(g) \rightarrow \text{ Ca}_3\text{N}_2 (s) \]

b. \[ \text{HBr(aq)} + \text{AgNO}_3 (aq) \rightarrow \text{HNO}_3 (aq) + \text{AgBr} (s) \]

c. \[ 2 \text{ As(s)} + 3 \text{ Br}_2 (g) \rightarrow 2 \text{ AsBr}_3 (g) \]

d. \[ \text{P}_2\text{O}_5 (g) \rightarrow 2 \text{ P(s)} + 5/2 \text{ O}_2 (g) \]

\[ q = C_s \times m \times \Delta T \]
1. (3 points) Find the oxidation number of the underlined element in each of the following species.

\[
\begin{align*}
\text{NO}_3^- & \quad \text{NI}_3 & \quad \text{H}_2\text{CO}_3 \\
\end{align*}
\]

2. (2 points) A particular substance has a specific heat capacity of 4.0 J/mol-°C. How much heat would have to be added to a 10.0-g sample to increase its temperature from 25.0 °C to 35.0 °C?

3. (3 points) A particular substance has a specific heat capacity of 4.0 J/mol-°C. If 200 J of heat were added to a 10.0-g sample of this substance, how much would the temperature change?

4. (2 points) Which one of the following represents a formation reaction used to define the standard enthalpy of formation? Circle the correct answer.

\[
\begin{align*}
\text{a. } & \quad \text{P}_2\text{O}_5 (g) \rightarrow 2 \text{P(s) + 5/2 O}_2 (g) \\
\text{b. } & \quad 3 \text{Sr(s) + N}_2(g) \rightarrow \text{Sr}_3\text{N}_2 (s) \\
\text{c. } & \quad \text{HI(aq) + AgNO}_3 (aq) \rightarrow \text{HNO}_3 (aq) + \text{AgI (s)} \\
\text{d. } & \quad 2 \text{P(s) + 5 Cl}_2 (g) \rightarrow 2 \text{PCl}_5 (g)
\end{align*}
\]

\[q = C_s \times m \times \Delta T\]
1. (3 points) Find the oxidation number of the underlined element in each of the following species.

\[ \text{NO}_2^- \quad \text{AsI}_3 \quad \text{H}_2\text{SO}_4 \]

2. (2 points) A particular substance has a specific heat capacity of 5.0 J/mol\(^\circ\)C. How much heat would have to be added to a 10.0-g sample to increase its temperature from 25.0 \(^\circ\)C to 35.0 \(^\circ\)C?

3. (3 points) A particular substance has a specific heat capacity of 5.0 J/mol\(^\circ\)C. If 100 J of heat were added to a 10.0-g sample of this substance, how much would the temperature change?

4. (2 points) Which one of the following represents a formation reaction used to define the standard enthalpy of formation? Circle the correct answer.

a. \[ \text{P}_2\text{O}_5 (g) \rightarrow 2 \text{P}(s) + \frac{5}{2} \text{O}_2 (g) \]

b. \[ \text{HBr(aq)} + \text{AgNO}_3 (aq) \rightarrow \text{HNO}_3 (aq) + \text{AgBr (s)} \]

c. \[ 2 \text{P}(s) + 3 \text{Cl}_2 (g) \rightarrow 2 \text{PCl}_3 (g) \]

d. \[ 3 \text{Mg(s)} + \text{N}_2(g) \rightarrow \text{Mg}_3\text{N}_2 (s) \]

\[ q = C_s \times m \times \Delta T \]