



Write a chemical equation that represents each of the following enthalpy changes.

- a enthalpy of formation of $\text{H}_2\text{O}(\text{l})$ $\text{H}_2(\text{g}) + \frac{1}{2}\text{O}_2(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$
- b enthalpy of combustion of $\text{C}_2\text{H}_6(\text{g})$ $\text{C}_2\text{H}_6(\text{g}) + 3\frac{1}{2}\text{O}_2(\text{g}) \rightarrow 2\text{CO}_2(\text{g}) + 3\text{H}_2\text{O}(\text{l})$
- c enthalpy of vaporisation of $\text{H}_2\text{O}(\text{l})$ $\text{H}_2\text{O}(\text{l}) \rightarrow \text{H}_2\text{O}(\text{g})$
- d enthalpy of atomisation of $\text{Br}_2(\text{l})$ $\frac{1}{2}\text{Br}_2(\text{l}) \rightarrow \text{Br}(\text{g})$
- e lattice enthalpy of formation of $\text{MgCl}_2(\text{s})$ $\text{Mg}^{2+}(\text{g}) + 2\text{Cl}^{-}(\text{g}) \rightarrow \text{MgCl}_2(\text{s})$
- f lattice enthalpy of dissociation of $\text{CaO}(\text{s})$ $\text{CaO}(\text{s}) \rightarrow \text{Ca}^{2+}(\text{g}) + \text{O}^{2-}(\text{g})$
- g enthalpy of solution of $\text{MgCl}_2(\text{s})$ $\text{MgCl}_2(\text{s}) \rightarrow \text{Mg}^{2+}(\text{aq}) + 2\text{Cl}^{-}(\text{aq})$ [or $\text{MgCl}_2(\text{s}) \rightarrow \text{MgCl}_2(\text{aq})$]
- h enthalpy of hydration of Mg^{2+} ions $\text{Mg}^{2+}(\text{g}) \rightarrow \text{Mg}^{2+}(\text{aq})$
- i bond dissociation enthalpy for N-H in NH_3 $\frac{1}{3}\text{NH}_3(\text{g}) \rightarrow \frac{1}{3}\text{N}(\text{g}) + \text{H}(\text{g})$
- j 1st electron affinity of oxygen $\text{O}(\text{g}) + \text{e}^{-} \rightarrow \text{O}^{-}(\text{g})$
- k 2nd electron affinity of oxygen $\text{O}^{-}(\text{g}) + \text{e}^{-} \rightarrow \text{O}^{2-}(\text{g})$
- l 2nd ionisation enthalpy of magnesium $\text{Mg}^{+}(\text{g}) \rightarrow \text{Mg}^{2+}(\text{g}) + \text{e}^{-}$