Marks
2
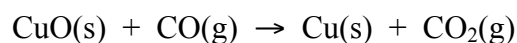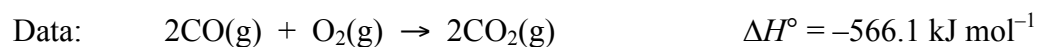
• Copper metal can be obtained by heating copper oxide , CuO, in the presence of carbon monoxide, CO, according to the following reaction.

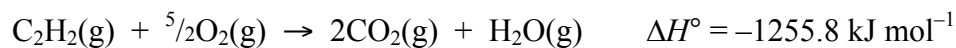$$CuO(s) + CO(g) \rightarrow Cu(s) + CO_2(g)$$

Calculate $\Delta H°$ for this reaction in kJ mol^{-1}.

Data: $2CO(g) + O_2(g) \rightarrow 2CO_2(g)$ $\Delta H° = -566.1$ kJ mol^{-1}

          $2Cu(s) + O_2(g) \rightarrow 2CuO(s)$ $\Delta H° = -310.5$ kJ mol^{-1}

Answer:

• Acetylene burns in air according to the following equation:

$$C_2H_2(g) + {}^5/_2O_2(g) \rightarrow 2CO_2(g) + H_2O(g)   \Delta H° = -1255.8 \text{ kJ mol}^{-1}$$

The $\Delta_f H°$ of $CO_2(g) = -393.5$ kJ mol^{-1}, $\Delta_f H°$ of $H_2O(l) = -285.8$ kJ mol^{-1} and $\Delta_{vap} H°$ of $H_2O(l) = +44.0$ kJ mol^{-1}. What is $\Delta_f H°$ of $C_2H_2(g)$?

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Answer: