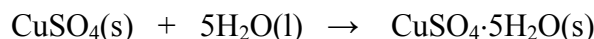


- Anhydrous copper(II) sulfate is a white powder that reacts with water to give blue crystals of copper(II) sulfate-5-water.



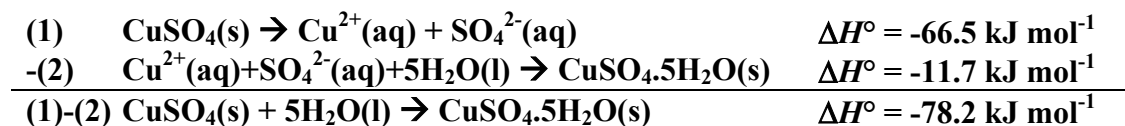
Calculate the standard enthalpy change for this reaction from the heats of solution.

Compound	$\Delta H^\circ_{\text{solution}} / \text{kJ mol}^{-1}$
$\text{CuSO}_4(\text{s})$	-66.5
$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}(\text{s})$	+11.7

The two reactions in the table correspond to:

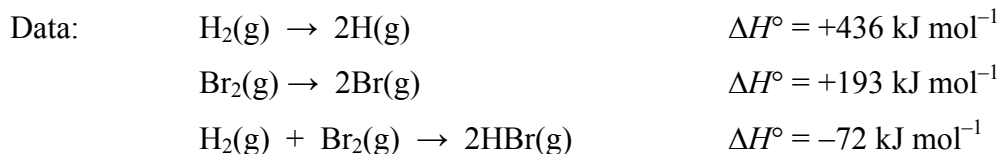
- (1) $\text{CuSO}_4(\text{s}) \rightarrow \text{Cu}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq})$
 (2) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}(\text{s}) \rightarrow \text{Cu}^{2+}(\text{aq}) + \text{SO}_4^{2-}(\text{aq}) + 5\text{H}_2\text{O}(\text{l})$

Taking (1) – (2) gives the required reaction:

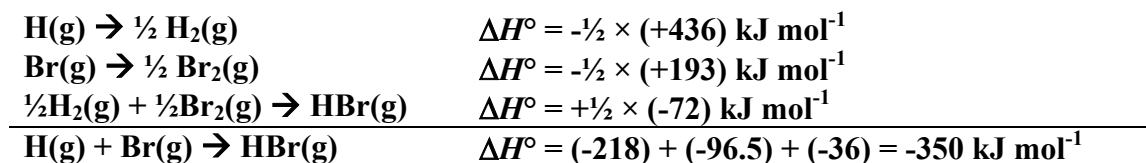


Answer: **-78.2 kJ mol⁻¹**

- Using the given data, calculate ΔH° for the reaction: $\text{H}(\text{g}) + \text{Br}(\text{g}) \rightarrow \text{HBr}(\text{g})$



The reaction corresponds to the combination:



$\Delta H^\circ = -350 \text{ kJ mol}^{-1}$

Marks
2

2