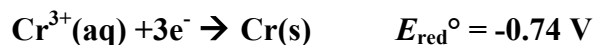


- Calculate ΔG° for the following reaction:



Marks
3

The two electrode potentials are:



The overall cell potential is therefore:

$$E^\circ = E_{\text{ox}}^\circ + E_{\text{red}}^\circ = (-0.53 \text{ V}) + (-0.74 \text{ V}) = -1.27 \text{ V}$$

Using $\Delta G^\circ = -nFE^\circ$ for this 3 electron transfer reaction:

$$\Delta G^\circ = -(3 \times 96485 \text{ C mol}^{-1}) \times (-1.27 \text{ V}) = +368 \text{ kJ mol}^{-1}$$

Answer: **+368 kJ mol⁻¹**

Is the reaction spontaneous under standard conditions? Give a reason for your answer.

**No. $\Delta G^\circ > 0$ and it must be negative for a spontaneous reaction.
Equivalently, $E^\circ < 0$ and it must be positive for a spontaneous reaction.**