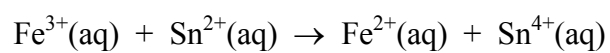


- Calculate the initial cell potential for the following *unbalanced* reaction at 25 °C from the standard electrode potentials. Assume the concentration of all species is initially 1 M.

**Marks**
4

Answer:

Calculate the equilibrium constant, K , for the reaction at 25 °C.

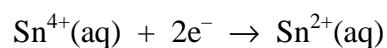
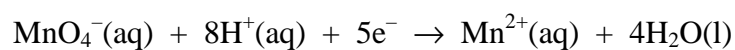
Answer:

- Give the oxidation number of carbon in each of the following.

$\text{CF}_2\text{Cl}_2(\text{g})$	
$\text{Na}_2\text{C}_2\text{O}_4(\text{s})$	
$\text{HCO}_3^-(\text{aq})$	
$\text{C}(\text{s})$	

Marks
2

- Consider a voltaic cell that uses the following half-reactions:



Write a balanced equation for the overall reaction.

3

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Which species is the oxidising agent?

Which species is the reducing agent?

Calculate the standard cell potential. (Refer to the table of standard reduction potentials.)

Answer:

Marks
6

- A galvanic cell is made of a Ni^{2+}/Ni half cell with $[\text{Ni}^{2+}] = 1.00 \times 10^{-3} \text{ M}$ and a Ag^+/Ag half cell with $[\text{Ag}^+] = 5.00 \times 10^{-2} \text{ M}$. Calculate the electromotive force of the cell at 25°C .

Answer:

Calculate the equilibrium constant of the reaction at 25°C .

Answer:

Calculate the standard free energy change of the reaction at 25°C .

Answer:

Indicate whether the reaction is spontaneous or not. Give reasons for your answer.

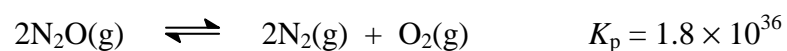
Express the overall reaction in the shorthand voltaic cell notation.

Marks
2

- Explain why copper dissolves in dilute HNO₃, but not in dilute HCl?

4

- Nitrous oxide decomposes at 25 °C according to the following equation.

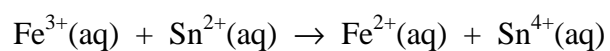


What is the value for K_p at 40 °C?

Answer:

Is the reaction endothermic or exothermic? Give a reason for your answer.

- Consider the following *unbalanced* reaction at 25 °C:



Calculate the standard cell potential.

Answer:

Calculate the equilibrium constant, K , for the reaction at 25 °C.

Answer: