ENGINEERING CHEMISTRY

Department of Science and Humanities

ENGINEERING CHEMISTRY

Electrochemical equilibria

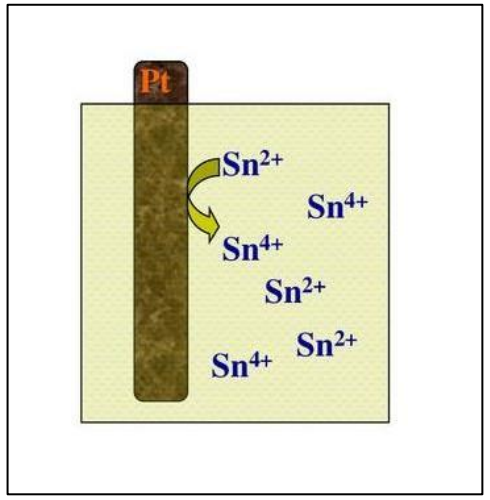
5. Oxidation - reduction electrode :

- It consists of an inert metal such as platinum immersed in a solution containing an appropriate oxidized and reduced form of redox system.
- The metal merely acts as electrical contact.
- The potential arises due to the tendency of one form to change in to other form.
  e.g.,$Pt/Fe^{2+},Fe^{3+}$, $Pt/Ce^{3+},Ce^{4+}$, $Pt/Sn^{2+},Sn^{4+}$
- For stannous stannic electrode

  $Sn^{4+} + 2e^- \rightleftharpoons Sn^{2+}$

- Nernst equation:

$$E_{Pt/Sn^{4+}/Sn^{2+}} = E^0{}_{Pt/Sn^{4+}/Sn^{2+}} - \frac{0.0591}{2}\log\left(\frac{[Sn^{2+}]}{[Sn^{4+}]}\right)$$



Source:https://slideplayer.com/slide/13860805/

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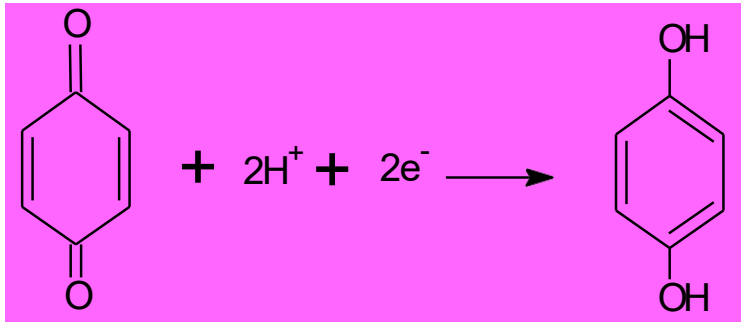
Electrochemical equilibria

Quinhydrone electrode

- It consists of an inert metal such as platinum immersed in a solution containing quinone and hydroquinone
- The metal merely acts as electrical contact
- The potential arises due to the tendency of quinone to change to hydroquinone
- **$Pt/Q,QH_2$**



- Nernst equation:

$$E_{Pt/Q/QH_2} = E^o{}_{Pt/Q/QH_2} - \frac{0.0591}{2}\log\left(\frac{[QH_2]}{[Q][H^+]^2}\right)$$

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Electrochemical equilibria

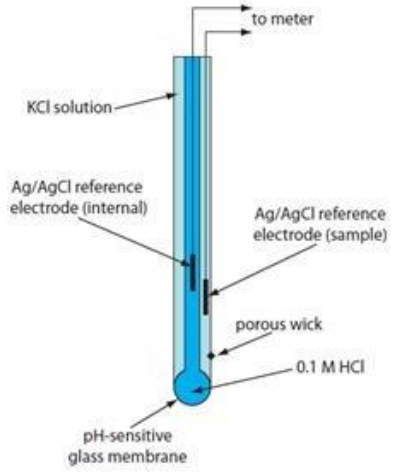
6. Ion selective electrode:(membrane electrode)

- It consists of a membrane in contact with a solution, with which it can exchange ions.

  e.g., **glass electrode**: selective to H^+, Na^+, K+ etc.

- Equation for determining potential for pH sensitive Glass electrode

$$E_G = E^0_G + 0.0591 \log_{10}[H^+]$$



Source:Analytical Chemistry 2.0, David Harvey, community.asdlib.org/activele...line-textbook/

THANK YOU

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