



19CH201 - ENGINEERING CHEMISTRY FOR CIRCUIT BRANCHES

UNIT-2 - ENERGY STORAGE DEVICES

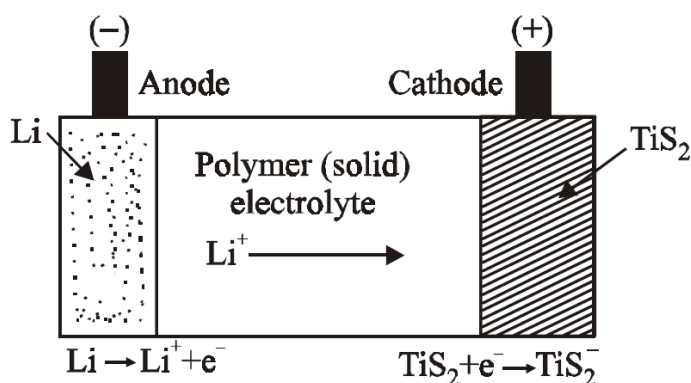
2.5. Lithium ion battery

Description

Anode : Li

Cathode : TiS_2

Electrolyte: Polymer (Solid) Electrolyte



Lithium battery is a solid state battery. It uses a solid electrolyte and not a liquid or paste electrolyte. Titanium sulphide acts as cathode and lithium metal acts as the anode. It produces cell voltage is 3.0V.

Description

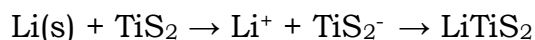
- It consists of a lithium anode and a TiS_2 cathode.
- A solid electrolyte generally a polymer is packed in between the electrodes.
- The electrolyte permits the passage of ions but not electrons.

Cell reactions

At anode: $\text{Li(s)} \rightarrow \text{Li}^+ + \text{e}^-$

At cathode: $\text{TiS}_2 + \text{e}^- \rightarrow \text{TiS}_2^-$

Overall reaction:





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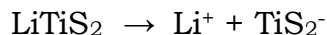
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Recharging:



Advantages of Li battery

It is the cell future. Why?

- Its cell voltage is high, 3.0V
- Since Li is a light weight metal, only 7kg material required to produce 1 mole of electrons.
- Since all the constituents of the battery are solids, there is no risk of leakage from the battery. This battery can be made in a variety of shapes and sizes.

Disadvantages of Li battery

- Li battery is more expensive than other batteries

Uses

- Button sized batteries are used in calculators, watches, Cameras, mobile phones, laptop and computers.