Redox-active Polymer as Cathode Material of Li^+ Battery

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1. Li^+ Battery

- Typical Li^+ battery reaction

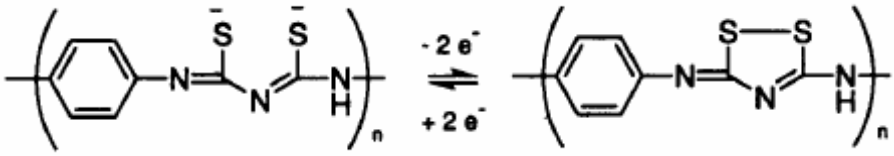
Anode reaction : $Li_xC_6 \rightleftharpoons xLi^+ + xe^- + 6C$

Cathode reaction : $Li_{1-x}CoO_2 + xLi^+ + xe^- \rightleftharpoons LiCoO2$

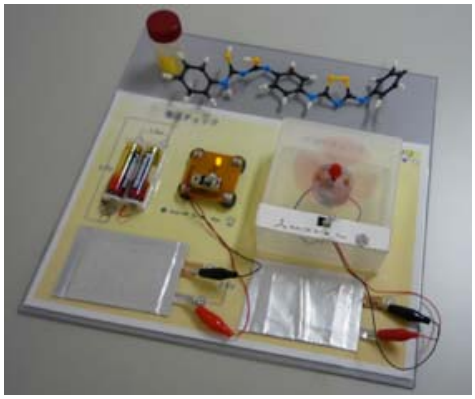
Cathode Material	Voltage	Energy Density
LiCoO2	3.7 V	140 mA·h/g
$LiMn_2O_4$	4.0 V	100 mA·h/g
$LiNiO_2$	3.5 V	180 mA·h/g
$LiFePO_4$	3.3 V	150 mA·h/g
Li_2FePO_4F	3.6 V	115 mA·h/g
$LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$	3.6 V	160 mA·h/g
$Li(Li_aNi_xMn_yCo_z)O_2$	4.2 V	220 mA·h/g
Our Redox-active polymer	2.7V	> 250 mA·h/g

2. Cathode Reaction of Redox-active Polymer 《 Poly(p-phenylene thiuret 》

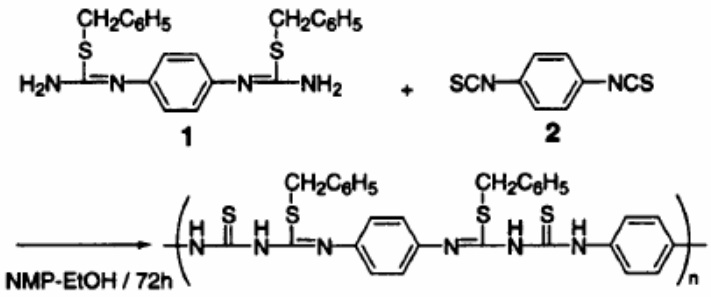
- Instead of LiCoO2, the new redox-active polymer is used as cathode material for Li^+ Battery.
- It is capable of an adequate redox reaction even at low temperature, and shows a high-capacity, high-energy density for Li^+ battery.



Reduced form　　Oxidized form



Synthesis of Poly(p-phenylene thiuret)



Poly(p-phenylene thiuret)

3. Patent status & Patent owner contact

- Patent license is available.

Patent No. : JP3969906 , US7214762
Apply country : JP,US
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