REESS SCOPE as a first step

REESS SCOPE to be addressed as a first step

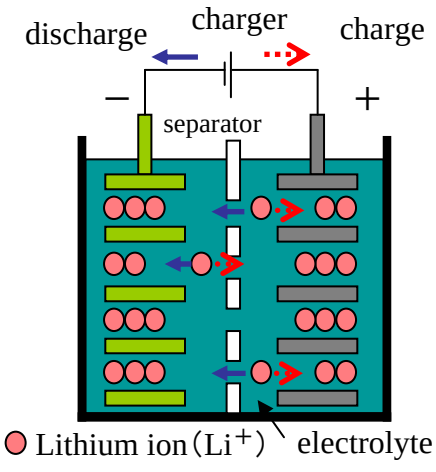
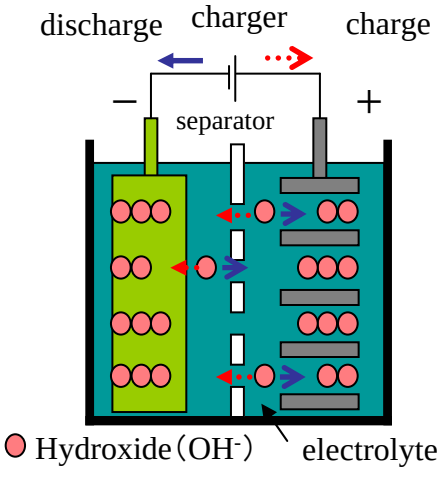
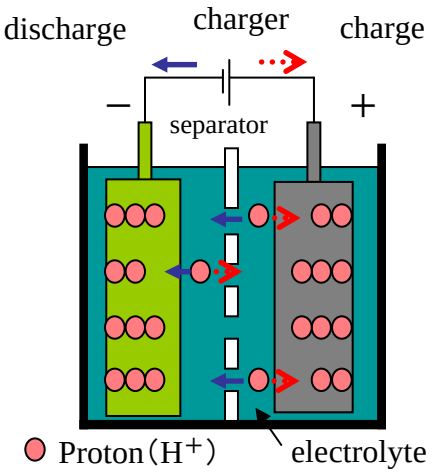
- **This sub-group has addressed to develop the new REESS safety requirements for higher BEV/PHEV/HEV production volumes in the near future**
- **Several types of REESS exist.**
  - **Non-water based electrolyte (e.g. Li-ion)**
  - **Water based electrolyte (e.g. NiMH, Lead-acid)**
  - **Molten salt, Molten metal (e.g. ZEBRA, NaS)**
  - **Capacitors, etc.**
- **At present and foreseeable future, the most of REESS for BEV/PHEV/HEV will use electro-chemical battery with Non-water based electrolyte or Water based electrolyte**

REESS SCOPE to be addressed as a first step

- **The major risks considered by the group is Fire/Explosion, while other safety aspect has been covered by existing regulations (ref. RESS-1-4)**
- **Flammability of the electrolyte is the key element to assess the potential risks of Fire/Explosion**
- **The potential risks are significantly different between**
  - **Flammable, non-water based electrolyte (Li-ion)**

    and
  - **Non-flammable, water based electrolyte (NiMH, Lead-acid)**

Difference between Flammable and non-Flammable

	Li-ion	NiMH	Lead-acid
Reaction mechanism			
carrier	Lituim-ion	Hydroxide-ion	Proton
cathode	Lithium metal oxide	Nickel oxyhydroxide	Lead dioxide
anode	Carbon	Hydrogen storage alloy	Lead
Electrolyte	Organic electrolyte **(Flammable)**	Aqueous alkaline **(non-Flammable)**	Dilute sulfuric acid **(non-Flammable)**
Flash point	**20-30℃**	None	None
Auto-ignition point	**About 450℃**(High volatile)	No ignition point	No ignition point
Auto-flammable limit	2.6-14.4 vol%	Non-Flammable	Non-Flammable

Difference between Flammable and non-Flammable

Flammability Test of electrolyte

Organic electrolyte for Lithium ion cell

Aqueous alkaline electrolyte for Nickel Metal Hydride cell

Conclusion

- **The R100/02 draft has been discussed focusing on the Li-ion which uses flammable electrolyte.**
- **It is inappropriate to simply apply to the other batteries without assessing the degree of the potential risks and the expected effect of the regulatory requirements.**

The potential risk of non-flammable electrolytes are far below than that of flammable electrolyte, as those has no flash point nor auto-ignition point.

The appropriate requirements for non-flammable should be developed for REESS as a next step after through examination of the potential risks and the effectiveness.

End