Advanced Mg–Li Hybrid Batteries

Mg–Li Hybrid Battery

Redox Reactions:
Anode:  \[ \text{Mg} \leftrightarrow \text{Mg}^{2+} + 2e^- \]
Cathode:  \[ 2\text{Li}^+ + 2e^- + 2\text{MO}_x \leftrightarrow 2\text{LiMO}_x \]
Overall:  \[ \text{Mg} + 2\text{Li}^+ + \text{MO}_x \leftrightarrow 2\text{LiMO}_x + \text{Mg}^{2+} \]

Li Cathodes:
- TiO$_2$, Mo$_6$S$_8$, TiS$_2$, LTO;
- LFP, LMO;
- S, FeS$_x$;

Contact: Guosheng Li, Ph.D.
Energy & Environmental Directorate
Pacific Northwest National Laboratory
Email: guosheng.li@pnnl.gov
Tel: (509) 371-6520
- Develop a stable and safe dual salt electrolytes. Electrochemical window up to 3.4 V vs Mg.
- Demonstrate a high voltage (~2.6 V) Mg–Li hybrid battery technology using LFP cathode.
- High energy density (~246 Wh/kg) Mg–Li hybrid battery was demonstrated.
- More cost effective hybrid batteries (such as Mg–Na battery) are under development.

Contact: Guosheng Li, Ph.D.
Energy & Environmental Directorate
Pacific Northwest National Laboratory
Email: guosheng.li@pnnl.gov
Tel: (509) 371-6520