

Development of innovative batteries for electric vehicle application

-Overview of RISING Project-

Zempachi OGUMI



Background and Project objectives

<Background>

- Increasing demand for environmentally-benign electric vehicles (EVs)
- Current EVs with limited driving distance (ca. 100 km / charging) due to insufficient energy of batteries, even with best lithium ion batteries (LIBs)
- Innovative batteries with high energy density (5 times of LIBs') required

<Establishment of RISING project>

RISING (Research and Development Initiative for Scientific Innovation of New Generation Batteries) Project founded in Kyoto University in 2009 under support of New Energy and Industrial Technology Development Organization (NEDO) Japan

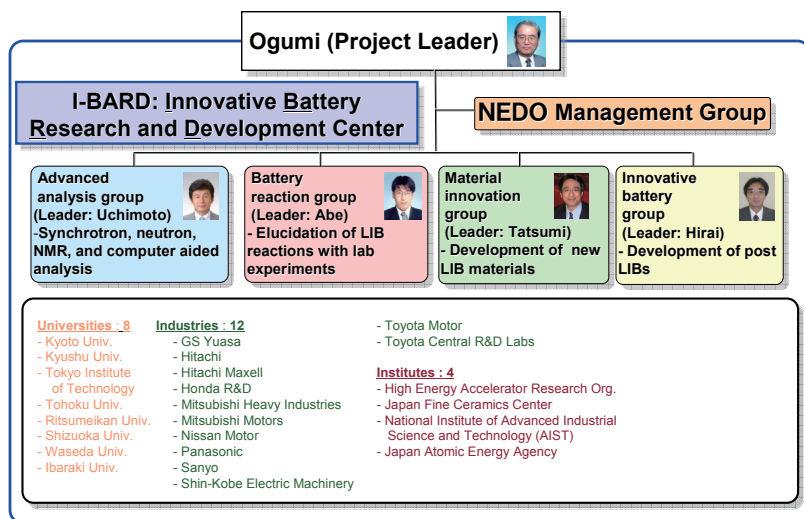
<Project target>

1. Development of technology to realize innovative batteries with its performance much superior to LIBs
2. Establishment of novel analytical methods with society-academia collaboration to understand and improve LIBs
3. Formation of interdisciplinary community for battery development



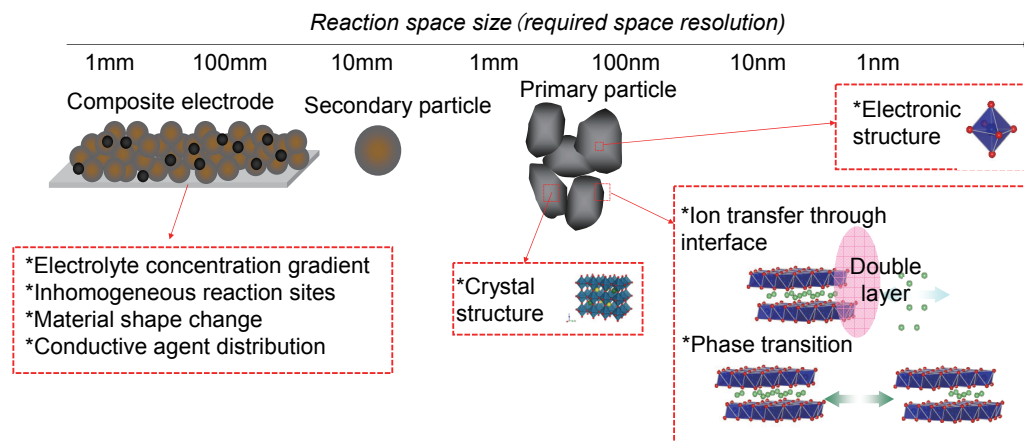
RISING kick-off meeting (Oct. 2009)

Formation of RISING Project



Technical Focus

- ✓ Observing through different space and time ranges
- ✓ Understanding LIB limitations to give new concepts for innovative batteries



Prospects

	2009	2010	2011	2012	2013	2014	2015
Development of advanced analysis	Development of hardware facilities and method <i>R&D Outputs</i>			Facilities optimization and multi-functional analysis establishment <i>R&D Outputs</i>			
Elucidation of LIB reactions	Reaction mechanism elucidation			Degradation mechanism elucidation		<i>R&D Outputs</i>	
LIB material innovation	Guidelines			to LIB material		innovation	
Basic research for post LIBs	Development of Innovative Batteries(Post-LIB) and its evaluation						

<Summary>

- ✓ Fundamental R&D activities needed for realizing batteries for vehicles
- ✓ Understanding limitation of current LIB technology with advanced analysis
- ✓ Fact-based new concept for realizing innovative batteries performing much superior to LIBs