School Seminar (2015-10)

School of Materials Science & Engineering

"Electrochemical Intercalation Chemistry of Multivalent Ions of Mg, Zn and Al in Transition Metal Host Materials for Future Batteries"

Prof. Hong, Seung-Tae

(Dept. of Energy Systems Engineering, DGIST)

2015. 04. 17. (Fri.) 15:00

APRI 1F, Auditorium Hall

Electrochemical Intercalation Chemistry of Multivalent Ions of Mg, Zn and Al in Transition Metal Host Materials for Future Batteries

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Abstract

Li ion batteries (LIB) are one of the most successful energy storage devices for portable electronics application, electrical vehicles, and utility grids. However, there are still strong needs for higher energy density and lower price materials than what the LIB systems can provide. Environmental friendliness, reliability, safety and plentiful sources could be typical advantages of magnesium, zinc and aluminum materials over the lithium. A rechargeable battery utilizing intercalation of multivalent ions such as Mg^{2+}, Zn^{2+} or Al^{3+} could be one of the strategies to overcome capacity limit of LIB, and/or to produce lower price batteries. Mg rechargeable batteries have received attention since the reversible Mg intercalation into the Chevrel phase, Mo_6S_8, was demonstrated in 2000. Very recently, zinc or aluminum-based rechargeable batteries have also received attention. However, only a few materials have been reported for the successful host materials that can intercalate such multivalent ions reversibly. The electrochemical intercalation chemistry is one of newly emerging research fields for future batteries. In the seminar, a recent progress in our exploration for new intercalation chemistry of such multivalent ions into various host materials will be presented, utilizing aqueous electrolytes as well as non-aqueous electrolytes.

_이력서

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<tr><td>관심 분야</td><td colspan="3">Solid State Chemistry
Rechargeable Mg, Zn, Al batteries
All solid lithium ion batteries
Phosphor materials for WLED applications</td></tr>
<tr><td>연구활동 및 학술활동</td><td colspan="3">학회활동: 대한화학회,한국전기화학회, 한국전지학회, 공업화학회,형광체연구회 등</td></tr>
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