Requests for Collaboration

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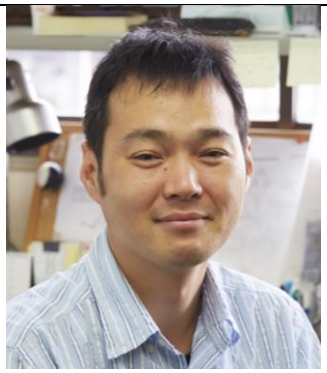

Research Interests

- Synthesis and characterization of lithium insertion materials for advanced lithium-ion batteries
- Electrochemical analysis on lithium insertion electrodes
- Electrochemistry for energy materials

Creative Achievements in The Application of New and Existing Science and Technology

(1) High voltage electrode materials: Five-volt lithium insertion material of lithium nickel manganese oxides having a spinel structure was improved their electrochemical properties by developing crystallinity [3].

(2) High capacity electrode materials: High capacity lithium insertion material of lithium nickel manganese oxides exhibited the highest reversible capacity of more than 350 mhA g^{-1} among the lithium insertion materials reported so far [4]. Novel electrochemical methods called "backstitch" charge and discharge method was developed to analyze a large voltage hysteresis, which is characteristic of high capacity Li-excess materials [1].

(3) Electrode material with high dimensional stability: Lithium cobalt manganese oxide showed no significant dimensional change during lithium insertion/extraction reaction, leading high energy and long-life lithium-ion batteries [2]. Zero-strain lithium insertion mechanism for the lithium titanium oxide was revealed by detailed structural analysis [5].

Technology (Product, Process, Device, Service etc.) That I Want to Request for Collaboration

- Ab-initio calculation for ceramics
- X-ray absorption spectroscopic analysis by synchrotron radiation
- TEM analysis of ceramics

A List of 5 Key Publications

[1] Quantitative analysis of large voltage hysteresis of lithium excess materials by backstitch charge and discharge method, K. Ariyoshi, T. Inoue, Y. Yamada, ***J. Electrochem. Soc***., **165**, A1-A7 (2018).

[2] High dimensional stability of $LiCoMnO_4$ as positive electrodes operating at high voltage for lithium-ion batteries with a long cycle life, K. Ariyoshi, H. Yamamoto, Y. Yamada, ***Electrochimica Acta***, **260**, 498-503 (2018).

[3] Effect of Primary Particle Size upon Polarization and Cycling Stability of 5-V Lithium Insertion Material of $Li[Ni_{1/2}Mn_{3/2}]O_4$, K. Ariyoshi, Y. Maeda, T. Kawai, T. Ohzuku, ***J. Electrochem. Soc.***, **158**, A281-A284 (2011).

[4] High-capacity lithium insertion materials of lithium nickel manganese oxides for advanced lithium-ion batteries: toward rechargeable capacity more than 300 mAh g^{-1}, T. Ohzuku, M. Nagayama, K. Tsuji, K. Ariyoshi, ***J. Mater. Chem.***, **21**, 10179-10188 (2011).

[5] Zero-strain insertion mechanism of $Li[Li_{1/3}Ti_{5/3}]O_4$ for advanced lithium-ion (shuttlecock) batteries, K. Ariyoshi, R. Yamato, T. Ohzuku, ***Electrochimica Acta***, **51**, 1125–1129 (2005).