

Materials Science in Battery Electrode: Identification and Physicochemical Properties

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Maximizing the function of reversible electrochemical energy storage is a growing society demand for materials scientist toward “green” sustainable earth. That should be initiated by materials identification with maximum potential properties, followed by thermodynamic overlooking and understanding to optimize them. Some of our technical approaches will be introduced using flexible and careful application of several experimental methodologies such as accurate synthesis, structural characterization, electrochemical measurements, and *ab-initio* computation to identify new materials as well as to rationalize several related properties. Particular focus will be put on (i) Jahn-Teller phenomena in spinel manganese oxide, (ii) phase diagram and transport properties of Olivine phosphate, and (iii) new sodium battery cathode material with exceptionally high-voltage generation. Our latest strategies toward better batteries will be introduced as time permits.