논문개요집

ISSN 2233-9485(Print)
ISSN 2233-9574(Online)

2021년 한국자기학회 하계학술대회

2021 KMS Summer Conference

논문개요집

일시 2021. 7. 21(수) ~ 23(금)

장소 강릉 세인트존스호텔

주최 한국자기학회

후원 KOFST 한국과학기술단체총연합회, GWTO 강원도관광재단, GSIPA (재)강릉과학산업진흥원, KIMS 한국재료연구원, epU 파워유닛스마트제조센터

Digests of the 2021 KMS Summer Conference

The Korean Magnetics Society

7월 22일(목) 14:00~17:05
Symposium 7 'Mössbauer Magnetics'

Barbuda1

좌 장 : 윤성현(군산대)

Study on cathode materials using Mössbauer spectroscopy

Hyunkyung Choi* and Chul Sung Kim†
Department of Physics, Kookmin University, Seoul 02707, Korea

Various energy storage technologies have been commercialized and used domestically, and technology development is actively underway. The fastest-growing lithium-ion battery in the Energy Storage System is lightweight, has no memory effect, and easily maintains it charge capacity. It is widely used in portable electronic devices and electric vehicles because it can save energy without loss for a long time because of a low natural discharge. A lithium-ion battery is composed of a cathode material, an anode material, an electrolyte, and a separator. Lithium ions, which exist in an ionic state, generate electricity by moving from the cathode to the anode during charging and from the anode to the cathode during discharging. These cathode materials are a reactant participating in an actual electrochemical reaction, and they are required to have an energy density, an output characteristic, increased lifetime characteristics, and improved stability. Therefore, the lithium-on activation capability of the cathode material determines the performance of the battery. In this presentation, the magnetic properties of iron-based cathode materials were analyzed X-ray diffraction and Mössbauer spectroscopy. The Mössbauer spectroscopy allowed us to determine the valence states of iron in the crystal structures of cathode and also to unveil the presence of different iron-containing phases. In addition, we present the changes in the structure and iron oxidation state accompanied with lithium extraction and insertion in cathode materials, and study magnetic hyperfine interaction with temperature.