

# 한국자기학회 2020년도 임시총회 및 하계학술연구발표회

## KMS 2020 Summer Conference

논문개요집



**일시** 2020. 7. 19(일) ~ 21(화)

**장소** 강릉 세인트존스호텔

**주최** 한국자기학회

초S-VI-3	15:00	<b>Electron Spin Resonance on Individual Atoms and Molecules on Surfaces</b> · 169 Xue Zhang, Yu Wang, Philip Willke, Aparajita Singa, Minhee Choi and Taeyoung Choi*
초S-VI-4	15:30	<b>Molecule-based magnetic thin film for spin-thermoelectrics</b> ..... 170 Inseon Oh*, Jungmin Park, Daeseong Choe, Junhyeon Jo, Hyeonjung Jeong, Mi-Jin Jin, Younghun Jo, Joonki Suh, Byoung-Chul Min and Jung-Woo Yoo <sup>†</sup>
초S-VI-5	16:00	<b>Coupled spin-charge transport in oxide interface</b> ..... 171 Jung-Woo Yoo*

7월 20일(월) 15:00~16:10

Special Session VII 'Mossbauer & Nano'

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✿ 좌 장 : 엄영랑(한국원자력연구원)

초S-VII-1	14:00	<b>Mössbauer spectroscopic study about firing conditions and coloring mechanism of the ancient Baekje black burnished potteries</b> ..... 175 Dong Hyeok Moon*, Myeong Seong Lee, Sang Won Nam, Hyen Goo Cho, Young Rang Uhm
초S-VII-2	14:30	<b>Activation Study of Nanocrystalline Ferrihydrite- Based Catalysts for Fischer-Tropsch Synthesis using Mössbauer Spectroscopy</b> ..... 176 Dong Hyun Chun*
초S-VII-3	15:00	<b>Study on the hyperthermia and magnetic properties of MNPs using Mössbauer spectroscopy</b> ..... 177 Hyunkyung Choi*, Chul Sung Kim
초S-VII-4	15:40	<b>Study of Archeological Heritages using Mössbauer Spectroscopy</b> ..... 178 Young Rang Uhm*, Gwang Min Sun, Hun-Kyung Choi and Chul Sung Kim

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Special Session VIII 'Electro-Magnetic Energy Convergence'

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✿ 좌 장 : 이정중(전자부품연구원)

초S-VIII-1	09:00	<b>Electrical Parameter Comparison of 8-pole 6-slot and 8-pole 12-slot using Equivalent Magnetic Circuit for Servo motor</b> ..... 181 Jin-Cheol Park*, Soo-Hwan Park, Sung-Woo Hwang and Myung-Seop Lim
초S-VIII-2	09:25	<b>A Study on the Design Technology of Synchronous Motors Related to the Improvement of Permanent Magnet Material Properties</b> ..... 183 Dong-woo Kang*
초S-VIII-3	09:50	<b>The Simulation Process of Electromagnetic Field, Thermal and NVH for EV/HEV Traction Motor</b> ..... 184 Eun-sil Han*

# Study on the hyperthermia and magnetic properties of MNPs using Mössbauer spectroscopy

Hyunkyung Choi\*, Chul Sung Kim

Department of Physics, Kookmin University, Seoul, 02707 Korea

Magnetic nanoparticles (MNPs) are attracting considerable attention as materials that are widely applied in medical fields such as biosensors, drug delivery systems, MRI contrast media, and in hyperthermia, and fundamental studies on the change in magnetic properties of nanoparticles have been actively studied. Hyperthermia was first reported by Gilchrist in 1957 as a technique to kill heat-sensitive cells, such as tumors, by applying heat with a temperature of 42 – 43 °C to localized areas of the body. Ultrasonic waves, microwaves, RF induction heating, etc. are used to apply heat to the local site. However, their use is limited as they use a high frequency band that can damage normal cells. To solve this problem, hyperthermia that uses magnetic nanoparticles, a method of killing cancer cells by converting a magnetic loss occurring when an external magnetic field is applied in a frequency range harmless to the human body into heat, has been studied. Furthermore, these magnetic nanoparticles are mainly used as oxides, and metal ions such as nickel, zinc, and manganese have been added in some cases. In this study, MNPs were synthesized by high-temperature thermal decomposition method. The magnetic and thermal properties of MNPs were investigated by VSM, Mössbauer spectroscopy, and magneTherm device. Based on the obtained results, we established suitable magnetic nanoparticles that can be applied to hyperthermia applications.