ABSTRACTS

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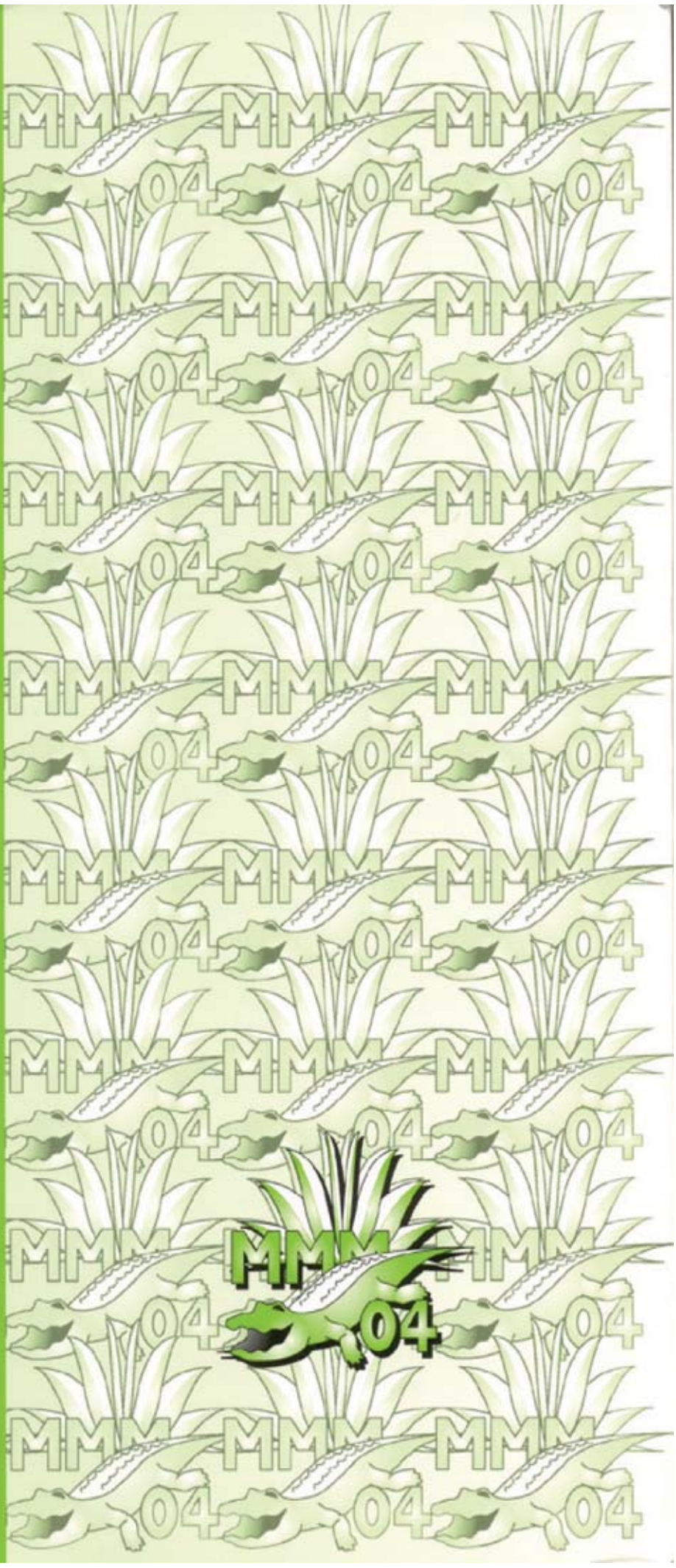

DP-14. Charge disproportionation transition under external field in $La_{1/3}Sr_{2/3}FeO_{2.96}$. *S. Yoon*[1] and C. Kim[2] *1. Dept. of physics, Gunsan national university, Gunsan, South Korea; 2. Dept. of physics, Kookmin university, Seoul, South Korea*

Polycrystalline $La_xSr_{1-x}FeO_{3-y}$ (x= 1/3) was studied by chemical titration method and XRD technique by refining its profile with GSAS package. Finally the aspects of charge-disproportionation transition above the transition temperature under magnetic field are investigated using external field Mössbauer spectroscopy. Eventually, the effects of magnetic field on the localization-delocalization phenomena and their corresponding conduction mechanisms in magnetic oxides are elucidated. Without external magnetic field, completely paramagnetic singlet was obtained in the temperature range in the averaged valence state. However, under the external magnetic field of 4T at 200K, which is above the CD transition temperature, a kind of hyperfine spectrum is superimposed upon the central singlet. This is the first observation for the fact that there is still a considerable amount (~50%) of Fe nuclei that does not experience the external field under an applied field. Isomer shift values have no remarkable dependencies upon the applied magnetic field. They are approximately 0.06 mm/s and effectively remain constant irrespective of the field strength. Furthermore, isomer shift of the doublet was almost identical to that of the central singlet for each spectrum. An investigation on the isomer-shift values for these two components leads to assign an intermediate average-valence ($Fe^{3.6+}$) due to hopping mechanism to these components. The ratio of hyperfine spectral area to the singlet area increases as the strength of applied magnetic field increases. However, this ratio shows a tendency that saturates as the field increases above 4 T. At 6 T, the hyperfine portion: singlet area ratio was about 37 : 63. When there exists a fast hopping of electrons, fluctuation of hyperfine parameters on ^{57}Fe nucleus would take place. This makes some fraction of Fe nuclei not feel the external magnetic field. An application of the external magnetic field can not suppress the thermally generated hopping of electrons, and the charge transfer energy and thus mobility of delocalized carriers will not be changed significantly.