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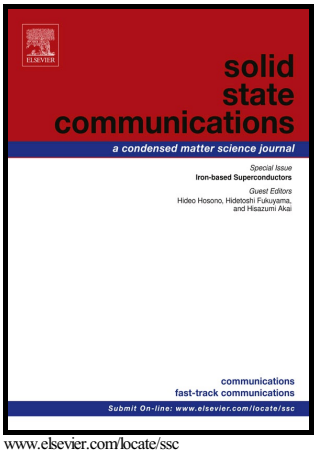

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S. Aouini, S. Ziti, H. Labrim, L. Bahmad

PII: S0038-1098(17)30311-3
DOI: https://doi.org/10.1016/j.ssc.2017.09.020
Reference: SSC13287

To appear in: *Solid State Communications*

Received date: 17 May 2017
Revised date: 4 September 2017
Accepted date: 25 September 2017

Cite this article as: S. Aouini, S. Ziti, H. Labrim and L. Bahmad, Monte Carlo Study of core/shell Polymer Nano-Structure Systems, *Solid State Communications,* https://doi.org/10.1016/j.ssc.2017.09.020

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Monte Carlo Study of core/shell Polymer Nano-Structure Systems

S. Aouini[1], S. Ziti[2], H. Labrim[3], L. Bahmad[1,*]

[1]Laboratoire de Magnétisme et Physique des Hautes Energies L.M.P.H.E. PPR-13, Mohammed V University in Rabat, Faculty of Sciences, B.P. 1014, Rabat, Morocco

[2]Laboratoire de Recherche en Informatique, Mohammed V University in Rabat, Faculty of Sciences, B.P. 1014, Rabat, Morocco.

[3] Centre National de l'Energie, des Sciences et des Techniques Nucléaires (CNESTEN), Rabat, Morocco.

Accepted manuscript

Abstract:

In this present work, we study the magnetic properties of the polymer nano-systems involving a core-shell structure. In fact, we investigate the effects of the external magnetic field, the anisotropy effect, the exchange coupling interactions and the temperature in order to explicit the magnetic properties of these polymer nano-structure systems. On the other hand, we examine the existence of the compensation temperature induced by the presence of the core-shell structure. Firstly, we present the ground state phase diagrams, in different planes of the physical parameters. On the other hand, we applied the Monte Carlo simulations, at non null temperature values, in order to investigate the thermal behavior of such nano-structure systems. To complete this study, we investigate the anisotropy crystalline effect on the partial and total magnetizations.

Keywords: Magnetic properties; Polymer Nano-structure; Monte Carlo simulations; Exchange coupling interaction; Anisotropy crystalline.

1- Introduction :

In recent years, the nanotechnology is becoming a rich field of various domains of the scientific research. The basic elements of the famous scientific discovery are the magnetic nano-particles [1-5]. The study of the fundamental properties, of such systems, enriches several scientific parts and develops diverse applications of these elements. This work is focusing on the polymers nano-structures [6-8]. It is worth to note that the investigation of the

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