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Abstracts

Local and global magnetic properties of reduced dimensions systems

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Resumo

Reduced dimensions systems present many potential technological applications. There is great interest in the development of small scale devices as well as in the control and manipulation at the nanoscale and in study of finite size on physical properties. Ag:R and NaYF4 :Gd NPs were prepared by chemical method. We observed a typical Lorentzian line-shape ESR lines for all studied dopants (R = Er, Yb e Mn). The g-factor found for Er3+ , Yb3+ e Mn2+ in the nanoparticles is very close to g-value found in ground-states of these ions in insulating cubic systems, in contrast that what was found in metals, where it is observed a g-shift for the metallic system. Furthermore, it was not possible to observe the Korringa relaxation for the ESR lines of Er3+ , Yb3+ e Mn2+ in the NPs system typically observed in metals. Therefore, the results suggest that the exchange interaction (Jfs) between localized magnetic moments (ML) and conduction electrons (c-e) is absent in Ag:R NPs, indicating that the nature of this interaction needs to be reexamined at the nanoscale range. For NaYF4 :Gd NPs, the particle control size was obtained by the amount of rps = precursor/surfactant. There was no evidence of Gd clusters in our results and we found the same characteristics observed in the bulk system: three resonance lines, with the controversies origins. It is still unknown the source of crystalline field of cubic symmetry with tetragonal combinations or orthorhombic or even Gd3+ sites with lower symmetries.Reduced dimensions systems present many potential technological applications. There is great interest in the development of small scale devices as well as in the control and manipulation at the nanoscale and in study of finite size on physical properties.