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Spin moment distributions in Cr-based antiferromagnetic rings Cr7M (M=Ni and Cd) studied by ^{53}Cr NMR YUJI FURUKAWA, Department of Physics and Astronomy, Iowa State University, CECILIA CASADEI, LORENZO BORDONALI, FERDIANDO BORSA, Department of Physics "A.Volta", Università degli studi di Pavia, GRIHORE TIMCO, RICHARD WINPENNY, Department of Chemistry, University of Manchester — Recent progress in synthesizing molecular magnets offers the opportunity to investigate magnetic properties of the system composed of small number of magnetically coupled spins. In this study, we have investigated magnetic properties of Cr-based antiferromagnetic (AF) ring Cr7M (M=Ni and Cd)). The ancestor of Cr7M is a well-known AF ring Cr8 with a spin single S=0 ground state due to AF interaction (J $\sim$ 16K) between nearest neighbor Cr^{3+} (s=3/2) spins. A substitution of one of eight Cr^{3+} ions with Ni^{2+} (s=1) or Cd^{2+} (s=0) leads to destroy the coherence of spin singlet ground state in Cr8. As a result, the Cr7M has a magnetic ground state with total spin S_T =1/2 and S_T =3/2 for Cr7Ni and Cr7Cd, respectively. In the magnetic ground state, local spin moments will appear on each Cr^{3+} ion. In order to investigate the details of spin moments distributions on Cr ions in the systems, we have carried out ^{53}Cr-NMR measurements in Cr7M in its magnetic ground state at low temperature. Based on the ^{53}Cr-NMR results, we will discuss differences in distributions of the spin moments in Cr7M systems in its magnetic ground state.

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