Thermal Diffusivity and Critical Behavior of *R*Sc(Si, Ge) (*R*=rare earth) Intermetallic Compounds

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The intermetallic family *R*TX (*R* = rare earths, T = 3*d*/4*d*/5*d* transition metals and X = *p*-block elements such as Al, Ga, In, Si, Ge, Sn, As, Sb, Bi) is attracting increasing interest because many of them present a large magnetocaloric effect as well as magnetoresistance. A thorough knowledge of their physical properties is needed in order to fully evaluate their potential. In this work, we are focusing on *R*Sc(Si, Ge) (*R* = Nd, Pr, Gd, Sm) where the critical behavior of the magnetic transitions (some of them are ferromagnetic, some others, antiferromagnetic) has been studied by means of *ac* photopyroelectric calorimetry in the standard back configuration. The retrieved thermal diffusivity has been fitted to the models corresponding to the different universality classes predicted by renormalization group theory, studying the changes from short to long range order as well as the (an)isotropy of the spin ordering. The different role played by Si and Ge in the indirect exchange interaction of the 4*f*-subshells of the rare earth ions through hybridization of the 3*d*-electrons of Sc atoms and the *p*-electrons of Si and Ge atoms is discussed for samples with different rare earths. The discussion is completed with magnetic measurements which allow retrieval of complementary critical exponents, which are in agreement with the ones obtained from the thermal measurements.