

Spin Ordering and Thermodynamical Properties in Spin-Pair Systems under Magnetic Fields

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journal or publication title	Science reports of the Research Institutes, Tohoku University. Ser. A, Physics, chemistry and metallurgy
volume	24
page range	193-193
year	1972
URL	http://hdl.handle.net/10097/27658

ABSTRACTS OF PAPERS
Published in Other Journals

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Abstract

It has recently been shown that in spin-pair systems a new type of spin ordering occurs under magnetic fields. In the present paper, the spin ordering in general cases of the inter-pair exchange interaction and the thermodynamical properties of these systems are investigated on the basis of molecular field theory. Various types of spin ordering appear depending on the strength of the inter-pair exchange interaction and the external magnetic field. The specific heat originating from the short range order of spins in a one-dimensional lattice is also calculated for a purpose of comparison with experiments in $\text{Cu}(\text{NO}_3)_2 \cdot 2.5\text{H}_2\text{O}$.

* The 1577th report of the Research Institute for Iron, Steel and Other Metals. Published in the Progress of Theoretical Physics, Supplement No. 46 (1970), 291.