

Nuclear spin structure of Sc metal-tvi ansle lattice spin structure-

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1997 Fiscal Year Final Research Report Summary

Nuclear spin structure of Sc metal-tvi ansle lattice spin structure-

Research Project

Project/Area Number

08454094

Research Category

Grant-in-Aid for Scientific Research (B)

Allocation Type

Single-year Grants

Section

一般

Research Field

固体物性Ⅱ(磁性・金属・低温)

Research Institution

Kanazawa University

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Keywords

Ultra Low Temperature / Nuclear Magnetism / NMR / Relaxation Time / SQUZD / Nuclear Demagnetization

Research Abstract

1) To determine the nuclear spin structure, we measured the spin-lattice relaxation time which gives the information about the RK-interaction between the nuclear spins. As the nuclear spin of Sc metal is $I=7/2$ and the crystal structure is hcp, nuclear spin levels split into 4 doublets due to the electric quadrupole interaction. This quadrupole splitting makes it so hard to measure the spin-lattice relaxation time by pulse NMR method. We succeeded to measure the NMR for a single crystal of Sc. We obtained the Korringa constant $_K(T_{1T}) = 1.20\text{sec} \cdot \text{K}$ for c-axis and $1.0\text{sec} \cdot \text{K}$ for a-axis. We will measure the T_1 at lower temperatures and also the magnetic field dependence of T_1 .

2) To achieve the nuclear spin order of Sc in Kanazawa university, we constructed the nuclear demagnetization cryostats. We succeeded to get 200mK and we measured the magnetic susceptibility of the heavy electron compound CeRu_2Si_2 down to less than 300mK. Contradicted to the previous report, the magnetic susceptibility increases with decreasing temperature monotonically and does not show any anomaly down to 300mK.

Research Products (10 results)

	All	Other
	All	Publications (10 results)
[Publications] Haruhiko, Suzuki: "Nuclear spin order of scandium" Czech,J.of Physics. 46.SuppIS4. 2183-2184 (1996)		▼
[Publications] Masaki, Sekine: "Search for CDW in alkali metal" Czech,J.of Physics. 46.S5. 2597-2598 (1996)		▼
[Publications] Zen-ichi, Iida: "Magnetic Susceptibility of nonmagnetic CeRu_2Si_2 below 1mK" Czech,J.of Physics. 46.S5. 2579-258? (1996)		▼
[Publications] Yoshihiro, Koike: "Magnetic Susceptibility of Sc.Single Crystal" J.Low Temp.Phys.107,1/2. 197-208 (1997)		▼
[Publications] A.V.Klochkov: "Magnetism and structural phasetransutims LiTmF_4 po??" JETP Lett.66.4. 266-270 (1997)		▼
[Publications] H.Suzuki, Y.Koike, K.Karaki, M.Kubota and H.Ishimoto: "Nuclear Spin order of scandium." Czech, J.Phys. S4. 2183-2184 (1996)		▼
[Publications] Masaki Sekine, S.Abe, Y.Tanaka, S.Nakagawa, H.Suzuki, H.Abe, K.Ohshima and T.Nakajima: "Search for CDW in alkali metal" Czech, J.Phys.S5. 2597-2598 (1996)		▼
[Publications] Z.Iida, S.Abe, H.Takeda, H.Yamamoto and H.Suzuki: "Magmetic susceptipility of non-magnetic heavey electron compound a Ru, Si_2 belon 1mK" Czech, J.Phys.S4. 2579-2580 (1996)		▼
[Publications] Y.Koike and H.Suzuki: "Magnetic Susceptibility of Sc Single Crystal" J.Low Temp.Phys. vol 107. 197-208 (1997)		▼
[Publications] A.V.Klochkov, V.V.Naletov, I.R.Mukhamedshin, M.S.Tagirov, D.A.Tayurskii and H.Suzuki: "Magnetic and Structural Phase transitions in LiTmF_4 " J ETP Lett.66. 25-29 (1997)		▼

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