## Study on Nuclear Spin Order and Quantum Fluctuation in Pt metal

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## 2002 Fiscal Year Final Research Report Summary

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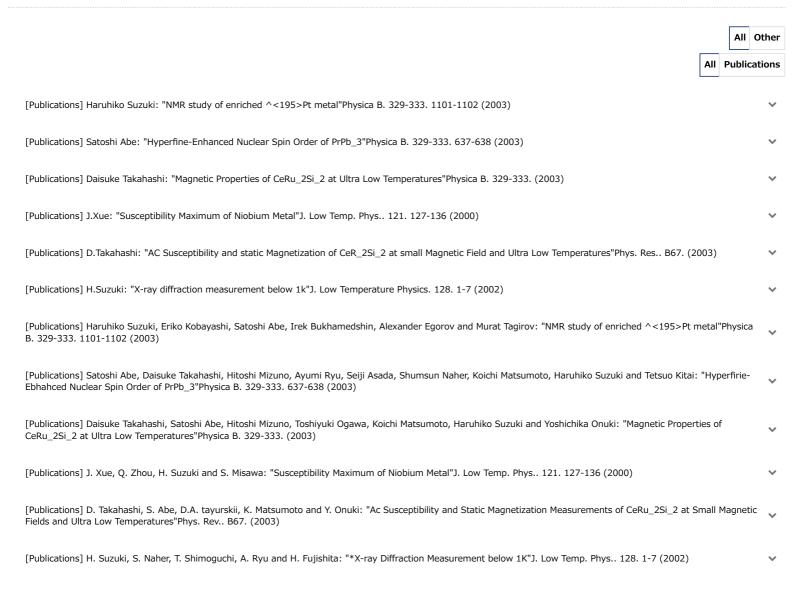
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Research Abstract

To estimate a nuclear spin ordering temperature in enriched 195Pt metal, NMR measurements were perfonned for the enriched 195Pt metal thin wire specimen. From the NMR measurements, the temperature and field dependences of spin-lattice  $(T_{-}1)$  and spin-spin relaxation times $(T_{-}2)$  were obtained. The value of Knight shift was also measured in enriched 195Pt metal. These measurements were also performed for the natural Pt metal thin wire which contains 33.8% 195Pt. Experimental results of the  $T_{-}1$  and Knight shift are same in both specimens. The  $T_{-}2$  in enriched sample is half of that in natural Pt specimen. This can be understood by the shorter distance among the nuclear spins in the enriched sample, resulting the stronger spin-spin interaction. But very interesting result is the field dependence of the  $T_{-}2$ . We observed the four times larger field dependence of  $T_{-}2$  in the enriched sample than one in the natural Pt sample. At present we cannot explain this result.

The temperature dependence of the magnetization of the enriched 195Pt sample was measured by using a SQUID magnetometer. It shows rather large Curi-Weiss like temperature dependence. The similar temperature dependences of the magnetization were also observed in the 80% enriched l95Pt thin wire sample and also the natural Pt thin wire sample which was made by the same procedures as the enriched thin wire sample. The amount of the magnetization is proportional the number of the 195Pt nuclear spin. Curie-temperature was estimated to be 0.7K. The natural Pt metal thin wire made vy the ordinary method, did not show this large temperature dependence of the magnetization. We will investigate, the origin of this anomalous magnetic behavior in Pt metal.

## Research Products (12 results)



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