

# A Study of CDW state in alkali metals

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# 1994 Fiscal Year Final Research Report Summary

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## A Study of CDW state in alkali metals

Research Project

### Project/Area Number

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05452053

### Research Category

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Grant-in-Aid for General Scientific Research (B)

### Allocation Type

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Single-year Grants

### Research Field

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固体物性Ⅱ(磁性・金属・低温)

### Research Institution

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Kanazawa University

### Principal Investigator

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### Co-Investigator(Kenkyū-buntansha)

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### Project Period (FY)

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1993 - 1994

### Keywords

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CDW / alkali metals / Dilution Refrigerator / SOR

### Research Abstract

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1.Preparation : Since the alkali metals are easily oxidized and also easily react with other metals, quartz and chemical solvents, we must be careful to treat the alkali metals. We made a rather large glove box inside which we can glow the single crystals of K metal and seal the crystal inside the quartz ampule together with He gas.  
2.SOR-Xray : At the Photon Factory of KEK in Tsukuba, We measured the x-ray at low temperatures by using a 3He-4He dilution refrigerator. The lowest temperature of the measurements was 75 mK.Compared the Laue spots measured at the lowest temperature with one measured at the liquid

Nitrogen temperature, some spots with some indexes has the satellite and split into two or more spots at the lowest temperature. At present we cannot conclude that these phenomena are resultant of the CDW transition.

3. Magnetic susceptibility : We measured the temperature dependence of the magnetic susceptibility of K metal by using a SQUID magnetometer between 1.8 and 300K. Above 20 K the magnetic susceptibility is almost temperature independent, but below 20 K it starts to decrease with decreasing temperature. And at about 10 K it decreasing more rapidly. At present we do not know if this temperature dependence of the magnetic susceptibility is due to the forming the electronic energy gap at the Fermi energy by CDW transition.

In conclusion our experimental results suggest the possibility of CDW state in K metal.

## Research Products (10 results)

All Other

All Publications (10 results)

- [Publications] H.Suzuki: "Nuclear Spin Order of Sc Metal" Physica B. 194-196. 249-250 (1994) ▼
  
- [Publications] H.Suzuki: "Magnetic Properties of Ba<sub>2</sub>Cu<sub>3-x</sub>M<sub>x</sub>O<sub>4</sub>Cl<sub>2</sub>(M=Ni,Zn)" Physica B. 194-196. 2275-2276 (1994) ▼
  
- [Publications] T.Nakajima: "Study of the Phase Transition by SR X-ray Diffractometer by D.R." Physica B. 194-196. 145-146 (1994) ▼
  
- [Publications] T.Nakajima: "Evidence for the Jahn-Teller Distortions of Cs<sub>2</sub>NaHoCl<sub>6</sub> at 150mK" J.Low Temp.Physics. 96. 47-59 (1994) ▼
  
- [Publications] S.Noro: "Magnetic Properties of Ba<sub>2</sub>Cu<sub>3O</sub>4Cl<sub>2</sub> Single Crystal" Materials Science and Engineering 22GD05:B25" 167-170 (1994) ▼
  
- [Publications] H.Suzuki: "Nuclear Spin Order of Sc Metal" Physica B. vol.194-196. 249-250 (1994) ▼
  
- [Publications] H.Suzuki: "Magnetic Properties of Ba<sub>2</sub>Cu<sub>3-x</sub>M<sub>x</sub>O<sub>4</sub>Cl<sub>2</sub> (M=Ni, Zn)" Physica B. vol.194-196. 2275-2276 (1994) ▼
  
- [Publications] T.Nakajima: "Study of Phase Transition by SR X-ray Diffractometry and Topography by He<sub>3</sub> Dilution Refrigerator" Physica B. vol.194-196. 145-146 (1994) ▼
  
- [Publications] T.Nakajima: "Evidence for the Jahn-Teller Distortion of Cs<sub>2</sub>NaHoCl<sub>6</sub> at 150 mK" J.Low Temp. Phys.vol.96. 47-59 (1994) ▼
  
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