

DEPARTMENT OF PHYSICS  
 OSAKA IMPERIAL UNIVERSITY.

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NO. 1955

第10回  
 物理学会

- 1) Metal & Crystal Structure → Metal Atom & Electronic Configuration
- 2) J.C. Slater's Model (Spin Valency)
  - i) Body centered → Exchange Neg.
  - ii) Face centered → Coulomb Force, or Exchange Positive
  - iii) Hexagonal → Coulomb Force. (Exchange small Neg.)
- 3) Inner Cell & 磁気
  - i) Coulomb force.
  - ii) Exchange Pos. (Ferromag) 2nd. 3rd s-electron  
 → 磁気交換力.
  - iii) Resultant Spin, Resultant L & 磁気交換力.  
 磁気交換力  $\Delta$  の spin-exchange 相互作用.  
 d 軌道の interaction を 2nd 3rd 軌道 (4-7 軌道)  
 (Ni, Co) 2nd 3rd 軌道 3rd 3rd 軌道.  
 磁気.  $\alpha$ : Ferro.  $\beta$ : para.  $\gamma$ : para.  $\delta$ : para.  $\epsilon$ : para.  $\zeta$ : para.  
 Ferro.  $\alpha$  の 2nd 3rd 軌道 3rd 軌道 Model の s 軌道 磁気交換力...
- 4) Wigner-Seitz's Model (Free Electron Model)  
 2nd 3rd 軌道 磁気交換力 相互作用. L & L.  
 electron 軌道 相互作用 の 磁気交換力 相互作用. L & L.  
 (Slater's  $\sigma$  Polar Model を 2nd 3rd 軌道 磁気交換力 相互作用.)

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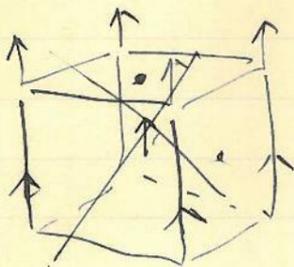
F. Hund, Internat. Conf. Report II. p. B6 - (1934)

	Examples	Melting Point	Solid State		
Rare Gases	He, Ne...	Very low		Atomic lattice	van der Waals + Valency
Polyatomic gases	H <sub>2</sub> , N <sub>2</sub> , O <sub>2</sub> , P <sub>2</sub> , Cl <sub>2</sub> - CH <sub>4</sub> ... = CO, CO <sub>2</sub> ... HCl, H <sub>2</sub> O, NH <sub>3</sub>	low	Insul.	Mol. lattice	
Salts	LiF, CsI MgO, CaF <sub>2</sub>	High	Ins.-El. Cond	Ionic lattice	El. St.
Metals	Na, Mg, Al, Fe Sc, N, TiC		Cond.		
Compound of the Nature of the diamond	Diamond, Si, B? SiC, BN	Very high	Insul.	Atomic lattice	Coulomb + Valence non directional (valency link)

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	Normal state (ion) (Ca <sup>2+</sup> ...)	Normal state (K...)
K	↑ s	s
Ca	↑ s 2s	s 2s
Sc	↑↑ sd 3d	↑↑ s <sup>2</sup> 1s
Ti	↑↑↑ sd <sup>2</sup> 4f	↑↑↑ s <sup>2</sup> 2d
V	↑↑↑↑ d <sup>4</sup> 5d	↑↑↑↑ s <sup>2</sup> 3f
Cr	↑↑↑↑↑ d <sup>5</sup> 6s	↑↑↑↑↑ s <sup>2</sup> 4f
Mn	↑↑↑↑↑↑ sd 7s	↑↑↑↑↑ s <sup>2</sup> 5s
Fe	↑↑↑↑↑↑↑ d 6d	↑↑↑↑↑ s <sup>2</sup> 6s
Co	↑↑↑↑↑↑↑↑ d <sup>8</sup> 3f	↑↑↑↑↑ s <sup>2</sup> 5d
Ni	↑↑↑↑↑↑↑↑↑ d <sup>9</sup> 2d	↑↑↑↑↑ s <sup>2</sup> 4f
Cu	↑↑↑↑↑↑↑↑↑↑ d <sup>10</sup> 1s	↑↑↑↑↑ s <sup>2</sup> 3f
Zn	↑ s d <sup>10</sup> 2s	↑ s d <sup>10</sup> 2s

