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A NOTE ON NEW METALLIC BONDING ORBITAL

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ABSTRACT

The existence of the elastic anisotropic channeling is based on the experimental evidences. The rotating electron pairs orbitals play the role of basic bonding orbitals. The abnormal signals from ligand domain and trans-membrane domain in cancer cell, Deformation in fatigue and creep at low stress, conduction, superconduction and semiconduction are all from the new metallic bonding orbital.

1. ELASTIC ANISOTROPIC CHANNELING AND LOCALIZED INTERATOMIC SUPERCONDUCTING ROTATIONAL ELECTRON PAIRS ORBITAL AT ROOM TEMPERATURE

Elastic anisotropic channeling of the microstructure in material makes localized internal rotating electron pairs orbital by its resonating valance electrons and electron accelerating even at room temperature, which reduce its temperature independent resistivity and increase resistivity temperature coefficient (Ref.1, Ref.2). Depending on modern superconductivity theories electron pairs are formed at very low temperature. But in recent research the modern superconductivity theories does not apply to all the newly discovered superconductors. Existence of the localized rotating electron pairs orbital in room temperature can explain all the discovered superconductors and unify all the modern superconductivity theories with the conceptual idea of partial superconductive state. The peaking of specific heat just below superconducting transition, which is due to an appreciable increase in entropy (or disorder), can also be explained clearly in view of thermodynamics. And the existences is based on the various experimental evidences (Ref.1). It is the localized interatomic superconducting orbital. The channeled state can make the localized rotating electron pairs orbital such as Fig.1 (Fig.8 in Ref.1). The orbitals are readily excited and can pass the localized electron pairs through material without resistivity with the aid of the site atoms in the next localized orbital. More the well channeled sublattices are, higher is the temperature of critical superconductive state such as Fig.2(Fig.9 in Ref.1). The very well channeled squares made by calcium atoms between copper oxide layers and by copper and oxygen atoms on the oxide layer make horizontally rotating electron pairs. The highly accelerated rotating electron pairs orbital can transfer pair electrons from one orbital to next without electric field by the aid of coulomb forces in the next orbital domain because it needs even number of atoms in the elastic anisotropic channeling. This is the trans-orbital superconduction. The elastic anisotropic channeling can be improved by artificial material processing as in modern superconductor development. It is raising the temperature of critical superconductive state even in this instant. The elastic anisotropic channeling in polycrystalline material can be oriented uniaxially by mechanical fatigue and creep. The mechanical processes rotate the elastic anisotropic crystal grains of the material by which the microstructure becomes oriented uniaxially. Its phenomena are verified by resistivity measurements (Ref.1, Ref.2, Ref.3, Ref.4, Ref.5, Ref.6).

2. NEW METALLIC BONDING ORBITAL

Author thinks that the localized rotating electron pairs play the role of basic metallic bonding orbital. It is imagined that the orbital gives electrons to σ-bonding on orbitals of the bonded atom as well as in ligand-field theory, in which the bonded atom is positioned at the center of the rotational electron orbital. Depending on the nature of the bonded metal atom and the orbital, the bonding orbitals may be of a covalent type, where the electrons are shared approximately equally between the bonded metal atom and the orbitals, or they may concentrate most electron density on the orbitals, and thereby represent ionic bonding. It is remarkable as a phenomenal evidence that the seed crystal in the liquid metal makes molten metal solidify in the same structure as itself. It is obvious that the conventional metallic bonding theory by electron gas clouds can not explain the systematic and regular crystallization. Probably the systematic crystallization is due to this new rotating metallic bonding orbital. In the early age of superconductor research the discovered superconducting metals are all metals that have almost pure metallic bonding. They are mercury, tin, indium and lead (Ref.7). This superconductivity is due to the rotating electron pairs of the new metallic bonding orbitals, which is interrupted for superconduction comparatively small because of their almost pure metallic bonding. When high temperature superconductors are compressed, critical temperature is raised (Ref.8). This is due to that the elastic anisotropic channel is tightened by compressive stress and the electron pairs on the orbital are more strongly rotating thereby. The coulomb forces for trans-orbital superconduction in the next orbital's domain become greater.

3. CAUSE ON ABNORMAL TRANS-MEMBRANE SIGNAL IN CANCER CELL

An understanding of the mechanisms responsible for the control of normal proliferation and differentiation of the various cell types which make up the human body will undoubtedly allow a greater insight into the abnormal growth of cells. Particular attention is now focused on the role of polypeptide growth factors as molecular which may play a central role as both positive and negative regulators of normal and abnormal growth control and development. A large body of biochemical evidence was eventually used to generate a receptor model with an external ligand binding domain linked through a single trans-membrane domain to the cytoplasmic tyrosine kinase and autophosphorylation domains(Fig.3). The ligands induced conformational change in the external domain generates either a push-pull or rotational signal which is transduced from the outside to the inside of cell. The ligand gives electron pairs to the receptor. The electron pairs are energy-leveled at σ-bonding orbitals by ligand field theory. Abnormal supply of electron pairs without ligand reaction in cancer cell is from the microstructure of the crystalline receptor material (abnormal proteins, see page. 315 in Ref.9), which is elastic anisotropically channeled by the lesions of its related DNA(its stressing, oncogenic virus and various kinds of carcinogens). The abnormally supplied localized rotating election pairs orbitals are attending on ligand independent signal at the σ-bonding orbital of the receptor The transmembrane domain of the receptor is composed of tyrosine, which is crystalline and therefore also able to be elastic-anisotropically channeled (nitrogen atoms, dimerization) with the results of the various degradation courses and consequence of DNA rearrangements. It is known that normal signal is made by dimerization of tyrosine and some oncogen make the tyrosine domain dimerized. Abnormal transforming hormones can also make ligand domain crystalline and elastic-anisotropically channeled. This makes a localized rotating electron bonding orbital, which supplies abnormally conformational signal from ligand domain to trans-membrane domain without hormonal signal(Ref.11). In order not to supply the notating electron pairs there are two methods for reduce elastic anisotropic channeling of the microstructure. The first is to reduce the elastic anisotropical channeling of the material's microstructure. These could be many traditional therapies and newly developed ones. The structure in the cancer cell must be improved into normal types. The second is to elevate the temperature of the cancered part, which is for reducing elastic anisotropy or coulomb forces and could be possible by chemical microbiological or physical method. A selective heating could also be very effective by electro-magnetic method.

4. NEW METALLIC BONDING ORBITAL AND DEFORMATION IN FATIGUE AND CREEP

In the conventional metallic bonding, metallic bonding consists of positive-ion cores (atoms without their valence electrons) and of valence electrons dispersed in the form of an electron cloud which covers a large extent of space (Fig.4). The valence electrons are weakly bonded to the positive-ion cores and are frequently referred to as free electrons. In the new metallic bonding orbital there consists of basic unit sets which are elastic- anisotropically channeled(for example square in BCC). The newly bonded atoms are placed at the central position of new metallic bonding orbital by ionic or weak covalent bonding. The newly bonded atoms make themselves elastic-anisotropically channeled square again and the electron's rotational motion accelerated. Therefore the orbital could pass by each other at very near distance. Electrons move from one orbital to another. Most of transition metals are composed of this metallic bonding and covalent bonding. Because the metallic bonding is weak and the plane of the bonding is regular, a small stress below the bulk yields stress can yield plastic deformation, which is called microplastic deformation and fatigue deformation [Ref.3, Ref.4, Ref.5, Ref.6]. But both metallic and covalent bonding joins in bulk plastic deformation above nominal yield stress.

5. NEW METALLIC BONDING ORBITAL, NORMAL CONDUCTION AND SUPERCONDUCTION

Electrical conduction is due mainly to the metallic bonding orbital electrons. Normal conduction electrons move from one metallic orbital to next one with the aid of electric potential field as in Fig.6 (a). The electric potential brings about electron's concentration gradient on the localized rotating electron pairs orbital. The concentration gradient provoke electron's flow between orbitals by electric potential and coulomb forces in the next orbital's domain. This flow does not need necessarily electron pair because it is due to concentration gradient and electric potential force. Superconduction electrons move from one orbital to next one without electric potential field by pair with the aid of only coulomb forces in the next orbital's domain because the resonance in the elastic anisotropic channeling needs even number of atoms and even number of electrons and therefore the normal rotating electron pairs orbital consists always of electron pairs as in Fig.6 (b). The highly accelerated rotating orbital transfers electron pairs from one orbital to next one without electric potential field as in Fig.6(b). This is the superconducting state or trans-orbital superconducting state. Face centered cubic structure has square and hexagonal planes of elastic anisotropic channeling. Body centered cubic structure has square planes of elastic anisotropic channeling. Closed packed hexagonal structure has hexagonal planes of elastic anisotropic channeling. It is believed generally that the structure that has more the elastic anisotropic channeling planes is more advantageous for better conduction. The copper oxide layers have high *Tc* because they have oxygen atoms between copper atoms in the elastic anisotropic channeling and the oxygen atoms attracts rotating electrons to the next orbital's domain as in Fig.7. An appreciable increase in entropy(or disorder) just below the superconduction transition is due to the localized and trans-orbital superconducting electron's mixing. The squares and hexagonal planes in real structures satisfy the Kronig-Penney clyclic potential model of closed ring type which suggests the localized superconducting band.

6. NEW METALLIC BONDING ORBITAL AND SEMICONDUCTORS

Semiconductors have diamond cubic structure, sphalerite structure and wurtzite structure. If temperature is raised, the electrons in the covalent bondings are promoted to the new metallic bonding orbitals of the elastic anisotropic channeling by thermal energy vibration. The elastic anisotropic channels in diamond cubic and sphalerite structures are FCC base atoms and also HCP lower and upper base atoms in wurtzite structure. The base atoms of elastic anisotropic channeling make the new metallic bonding orbitals with the promoted electrons by the thermal phonon and make the conduction bands or the localized interatomic superconducting orbital.

7. CONCLUSION

(1)The highly accelerated localized rotating electron pairs orbitals in the elastic anisotropic channels can transfer pair electrons from one orbital to next without electric field because the channeling needs even number of atoms.
(2)The existence of the elastic anisotropic channeling is based on the experimental evidences, where rotating the crystal grains of the metal by creep reduces its temperature independent resistivity and increases resistivity temperature coefficient.
(3) The localized rotating electron pairs orbital plays the role of basic metallic bonding orbital.
(4) The abnormal signals in cancer cell are due to the abnormal localized rotating electron pairs orbital in ligand domain and trans-membrane domain by the elastic anisotropic channeling structures made by the lesions of related DNA.
(5) Deformations in fatigue and creep at low stress are mainly due to the new metallic bonding orbitals of the elastic anisotropic channeling.
(6) The conduction and the superconduction are made by the transfer of electrons of the localized rotating orbitals in the metallic bonding according to accelerating rotating power of the elastic anisotropic channeling with or without electric potential.
(7)Semiconductors promotes their electrons from covalent bonding orbitals to the new metallic bonding orbitals by thermal phonon.

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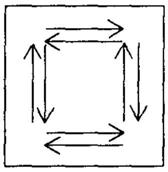

Fig.1 Channel of Elastic Anisotropy and Electron Pairs(Ref.1)

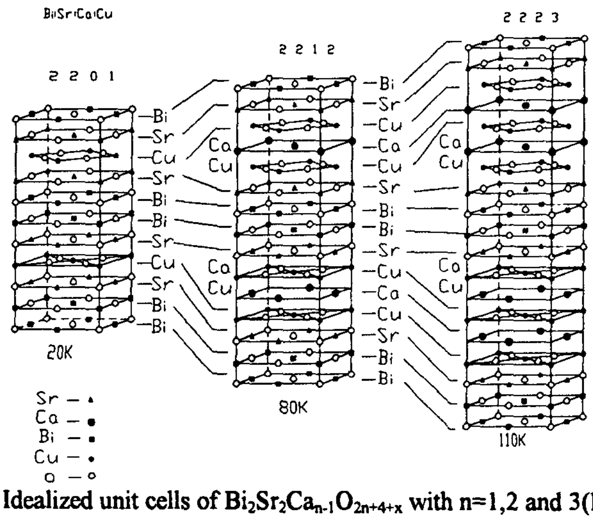

Fig.2 Idealized unit cells of $Bi_2Sr_2Ca_{n-1}O_{2n+4+x}$ with n=1,2 and 3(Ref.1)

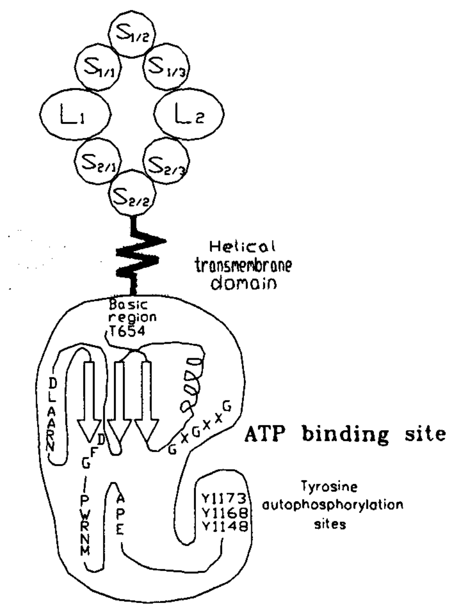

Fig.3 A model for the structure of the epidermal growth factor(Ref.2)

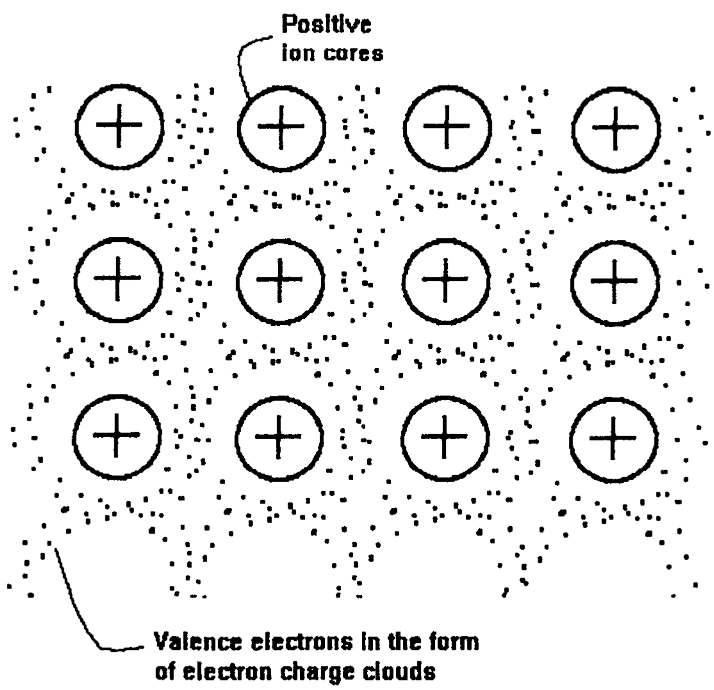

Fig.4 Two-dimensional Schematic diagram of metallically bonded atoms

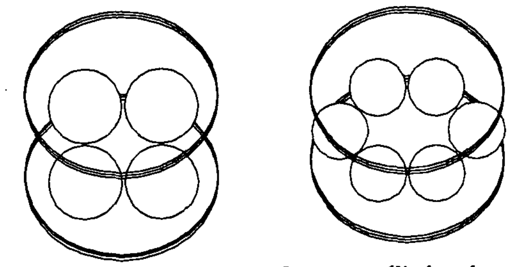

Fig.5 Basic unit sets of new metallic bond

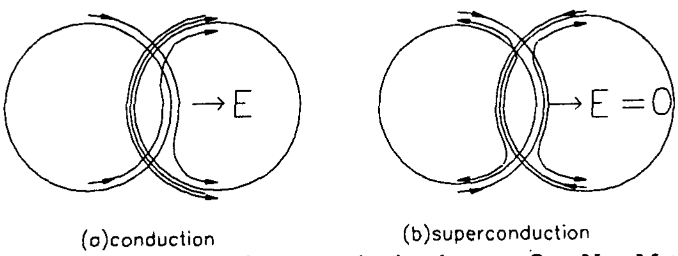

Fig.6 Mechanism of Conduction and Superconduction between One New Metallic Bonding Orbital and the Next

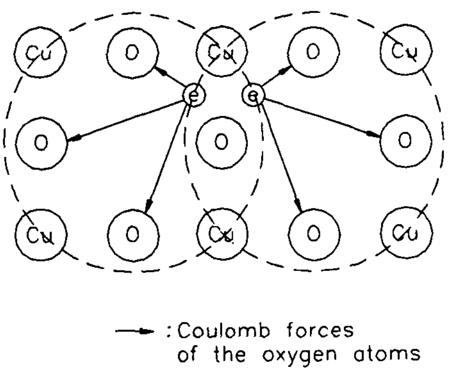

Fig.7 Copper oxide superconductor