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Nature of chemical elements

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The main problem is that using X-rays, we have determined the crystal lattices of different materials and why they are so and not others, are not yet known. For example, copper crystallizes in the fcc lattice and iron in the bcc, which becomes fcc on heating and this is used for heat treatment of steels. Copper does not change the crystal lattice when heated. There are many factors affecting the crystallization in the literature, so they decided to remove them as much as possible and the metal model in the article, say so, is ideal, i.e. all atoms are the same (pure metal) without inclusions, without implants, without defects, etc. using the Hall effect and other data on properties, as well as the calculations of Ashcroft and Mermin. My main determining factor for the type of lattice was the core of the atom or ion, which resulted from the transfer of some electrons to the conduction band. It turned out that the metal bond was due not only to the socialization of electrons but also to external electrons of atomic cores, which determined the direction or type of the crystal lattice. The change in the type of metal lattice can be connected with the transition of an electron to the conduction band or its return from this zone, i.e. phase transition. It is shown that in the general case, the metal bond in the closest packages (hec and fcc) between the centrally chosen atom and its neighbors is presumably carried out by means of nine directional bonds, in contrast to the number of neighbors equal to 12 (coordination number). Probably the "alien" three atoms are present in the coordination number 12 stereometrically and not because of the connection. The answer is to give an experimental test.

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Latest progresses of laser applications in industry

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Laser energy is widely used as a tool for manufacturing in industries which is called Laser Materials Processing. Laser welding, laser cutting, laser drilling, laser surface engineering (laser coating, laser hardening and peening), laser forming, laser hybrid processes and laser additive manufacturing are some of the key applications of laser in industries. Laser can improve the efficiency, quality, and capabilities of the production processes. Laser materials processing plays a crucial role in new manufacturing era. In this speech different applications and physical mechanisms of laser materials processing will be introduced briefly. The significance and advantages of using laser in industry will be presented as well. Selecting the appropriate type of laser for special manufacturing process will be explained. Latest researches on laser application in industries are presented. State of the art in laser materials processing, recent accomplishments and the future of laser application in industries will be discussed.

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