Ben Ghozlen M.H.,

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Firstly, the electronic structures of the 8 crystal structures of elements Li, W, Fe, Co, and Cu. The general empirical equation for all elements just mentioned in the title to calculate their values are given.

Some results are summarized and compared to the available experimental data relative to Fm3m subgroups.

According to Landau theory, second order or nearly first order phase transitions in crystals involve the onset of an order parameter which transforms according to one irreducible representation of the high symmetry space group. In this investigation the irreducible representations of Fm3m are examined at T, V, L and W high symmetry points of the cubic face centered Brillouin zone. The order parameters relevant to all the arms of a given star are considered and all the space subgroups of Fm3m are obtained. Some of these results are summarized and compared to the available experimental data relative to Fm3m subgroups.

One of the authors (Z.I.) has recently built a high-temperature X-ray diffraction apparatus using a YAG laser beam as a heating source. With this apparatus we have succeeded in observing directly the phase transformation of the 9R polytype at 2000°C. Single crystals of 9R grow together with the 2M type on a Mo substrate through chemical vapor deposit from a mixture of SiCl4, CCl4 and H2 gases at 1400°C. 9R is really a rare polytype. Fortunately, a few specimens of 9R were found in the majority of 2H. Each of the 9R crystals was sealed in an Ar gas atmosphere in a thin glass capsule to prevent the crystals from decomposing. With samples thus prepared, structural changes of 9R were determined while heated in a high temperature X-ray camera. No change of the X-ray diffraction pattern appeared before the temperature reached 2000°C. Upon heating to 2000°C, the diffraction spots corresponding to the 9C type began to appear slightly on the X-ray film, mixing with those of 9R. The 9C spots became clear after 2 hours of heating. This result proves Inoue's principle to be valid, that is, a stacking sequence of "1" in Zhdanov symbol will not be stable at temperatures over 2000°C (J. Material Sci. (1982) 17 3189), because the layer stacking sequence of "1" in Zhdanov notation.

Firstly, the electronic structures of the 8 crystal structures of elements Li, W, Fe, Co, and Cu. The general empirical equation for all elements just mentioned in the title to calculate their values are given. Based on these hybridizations, the distributions of the number of covalent bond electron pairs (3d, 4s, 4p), as well as the number n, of lattice electrons are determined directly from the concerned crystal structures. The corresponding hybridizations of states of α, β, γ, δ, ε, ζ, η, θ, ε, and Cu as well as the valence electron distributions as already published in the above mentioned two papers: S. H. YU, Science Reports of Solid-Molecular State Physics and Chemistry of Jilin Univ. No. 1 (1967) 7-25) are presented together with the theoretical magnetic moments of 3d 

m(α), spin-orbit(m(β), 4s(m(γ)), for α-Fe and ε-Co and total magnetic moment (m(θ)) of γ-Fe. The general empirical equation Ec and Tmk all due to lattice electrons are given to calculate their values of Cu, α-Fe, W. The theoretically calculated values are somewhat below the accuracy of Ec and Tmk appear all satisfactory to the first order of approximation. The formula for the calculation of additional electronic properties and thermal conductivities can be understood as well by the five factors. They are also discussed to certain extent in the text.