particularly the transition elements, with increasing pressure their d-bands also drop, but the electron realignment is less pronounced, since they have sufficiently filled d-bands even at normal pressure.

In this sense the metals K, Rb, Cs, Ca, Sr, Ba, Sc, and Y can be called pre-transitional not only because they lie ahead of the transition element in the periodic table, but because their d-bands become filled with increasing pressure.

Generally speaking, electronic realignment need not necessarily accompany structural phase transitions, but it becomes manifest in many phenomena. For example, in K [4], an anomalous growth of the electric resistivity is observed in the corresponding pressure region. It is characteristic that the dropping of the d-bands becomes noticeable long before the complete overlap of the s- and d-bands. This gives grounds for assuming that the d-levels become resonant with increasing pressure. This fact was recently used as a basis for investigations [5, 6] of the influence of the d-levels on kinetic phenomena in K, Rb, and Cs at normal pressure. The authors of these papers considered the d-levels as resonant ones in the electron-ion scattering and obtain results, particularly for the electric resistivity, which are in better agreement with experiment than the results of others.

Proceeding now to superconductivity, we see that the occurrence of superconductivity under pressure can be easily understood from the point of view of the change in the band structure of the elements. When the pressure is increased, the weakly filled d- or f-levels drop and begin to behave like resonant levels. This affects the electron-ion scattering and leads to an increase in the matrix element of the electron-phonon interaction. The result is the appearance of superconductivity and increase of the electric resistivity with pressure at temperatures above critical.

The possibility that the superconductivity of Ce under pressure is connected with the existence of 4f-levels is discussed in [2], but is regarded as doubtful in connection with the observation of superconductivity in Y, where there is no f-state close to the Fermi surface. From our point of view, these results do not contradict each other, since we assume that the superconductivity of Y is connected with the increase in the number of d-states on the Fermi surface with increasing pressure. We note that transition metals containing 2d-electrons (Ti, Zn, Hf) and more (V, Nb, Ta) are already superconducting at normal pressure, while the temperature of the superconducting transition increases with increasing number of d-electrons.

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