

Jan Urbanec, Čestmír Šimáně: Рентгеновское излучение, возбуждаемое протонами

X-RAYS EXCITED BY PROTONS ON Zn, Cu, Ni, Co, Fe

(Excerpt from Preceding Paper)

JAN URBANEC, ČESTMÍR ŠIMÁNĚ
Institute of Physics, Czechosl. Acad. Sci., Prague

Measurements of the dependency of the intensity of the K_α lines of X-ray radiation excited by protons on the energy of the protons was carried out on five adjoining elements. The measurements were carried out for an energy of the protons between 400 and 700 keV. The X-ray were decomposed into their spectrum by a crystal of NaCl in a Bragg spectrometer which was constructed for work in a space having a strong background of gamma rays produced in the accelerating tube by parasitic nuclear reactions. The detection of the reflected X-rays was carried out by a bell-type GM counter in a lead shield. The current of protons from the accelerated tube was focused on the target to a diameter of 2 to 3 mm. The protons were separated from the molecular ions by a magnetic analyzer the magnetic field of which was automatically adjusted in such a manner that protons of all energies were always focused on the same place of the target. The ion current was integrated by an electronic integrator working linearly in the range 0–60 μ A. The dependencies of the intensities of the K_α lines obtained differed somewhat from the dependencies foretold by Henneberg. The deviations are of the order of errors caused by statistical fluctuations on the one hand and probable small changes of the focus due to changes in the energy of the protons on the other.

The experiment proved that the intensity of the K_α line decreased with increasing atomic number. An estimate of the ratio of the intensities could not be carried out due to the unknown primary and secondary extinction of the used crystal of NaCl. Absorption measurements in the direct beam were therefore carried out and the dependence according to the theory of Henneberg was thereby proved.

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