THE WAVE THEORY OF THE CRYSTALLINE STATE

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The wave function for a harmonic standing wave reads

$$\Psi(x,t) = A \cdot \sin\left[2\pi\left(\frac{x}{\lambda}+k\right)\right] \cdot \sin[2\pi\nu t] \quad (1)$$

Considering the mathematical basics (Figure A) one concludes:

$$\lambda = \tilde{n}d \quad (2)$$

where ñ is the *wave density tensor*, representing the new wave-particle complexity principle - an advanced concept comparing to the wave-particle duality. In particular, for a linear isotropic system

$$\lambda = 2d \quad (3)$$

as confirmed with the Bragg diffraction experiments. The condition (2) represents a pure mathematical evidence that the photons are not a mathematical points, moving with a certain speed, but different size particles, with a speed considered constant in a vacuum. The latter assumes the consideration the mass of a zero photon mass is relative and determines the speed of our Universe in a vacuum or the speed of an origin towards our Universe. Then the correct approximation the mass of a vacuum is zero, but not a mass of a photon, and in a local system the photon mass, calculated from the(2) is $10^{-33}/\lambda$(nm) gram.

Representation of the powder diffraction pattern as a set of wavelengths calculated according to (3) exactly reflects wave-particle complexity principle of an atom and a substance, and is considered of benefit for further development of solid state theory.

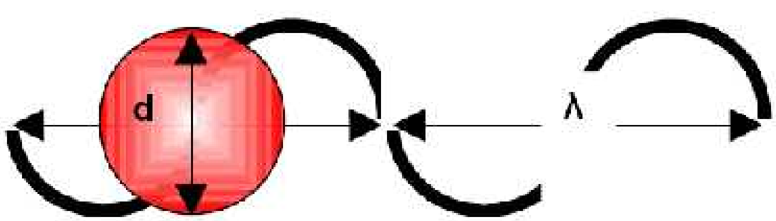

Figure A. *The relation of the wavelength to the particle size.*