

Evolution of Nanostructure States of Cu-powders Prepared by Ball Milling

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By HREM it was shown that the nanostructure states of Cu-powder prepared by ball milling is characterized by the presence of a high density of dislocations and twin faults. For the determination of microstructure parameters of Cu-powder the method of analysis of the X-ray powder diffraction pattern was developed [1].

The microstructure evolution of Cu-nanostructured powders depending on the ball milling conditions (namely, frequency of shocks, kinetic energy of shocks, the ratio between normal and tangential components of shock under constant time of the milling) was investigated. It is shown that the frequency of shocks in the range of 6-17 Hz does not affect on microstructure characteristics. The dislocation and twin densities are functions of the kinetic energy of shocks and the dislocation and twin densities change in non monotonous way when the energy of shocks increases. The ratio between normal and tangential components of shock is dominant factor that determines the ratio between edge and screw of dislocations.

[1] Ustinov A., Olikhovska L., Budarina N., Bernard F., *Diffraction analysis of the microstructure of materials*, Eds. E.J. Mittemeijer, P.Scardi, 2003, 333-359.

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