COPPER OXIDES SYNTHESIS BY USING COAXIAL MAGNETOPLASMA ACCELERATOR[1]

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Nanodispersed copper oxides are widely used in high-temperature superconductivity due to its high physical and chemical properties [1-2]. Currently, obtaining of pure materials with a relatively narrow particle size distribution representing single crystal is an important issue. All existing synthesis methods of nanodispersed copper oxide are not effective enough. In this article, the obtaining of nanodispersed copper oxide by plasmodynamic method was researched.

An analysis of ultradispersed plasmodynamic synthesis product obtained using coaxial magnetoplasma accelerator with copper electrodes was carried out [3]. The getting powder was analyzed by X-ray diffractometer Shimadzu XRD 7000 using the temperature consoles Anton Paar TTK450. Using this analysis such phases as copper Cu, copper oxide (I) Cu_2O, copper oxide (II) CuO, and copper hydroxide hydrate $Cu(OH)_2 \cdot H_2O$ were identified in the product. The dominant phase in the synthesis product is copper oxide CuO with an average size of coherent dispersion 14 nm. The main advantage of CuO over Cu_2O is the most stability material, so further research was gradual heating of the material to increase the mass of CuO. In the figure 1 are shown X-Ray diffraction patterns of the obtained material and annealed powder. The mass of copper oxide increased up to 98% and copper hydroxide hydrate. During the annealing the powder at 800 ºC mass fraction of copper oxide was increased up to 98%.

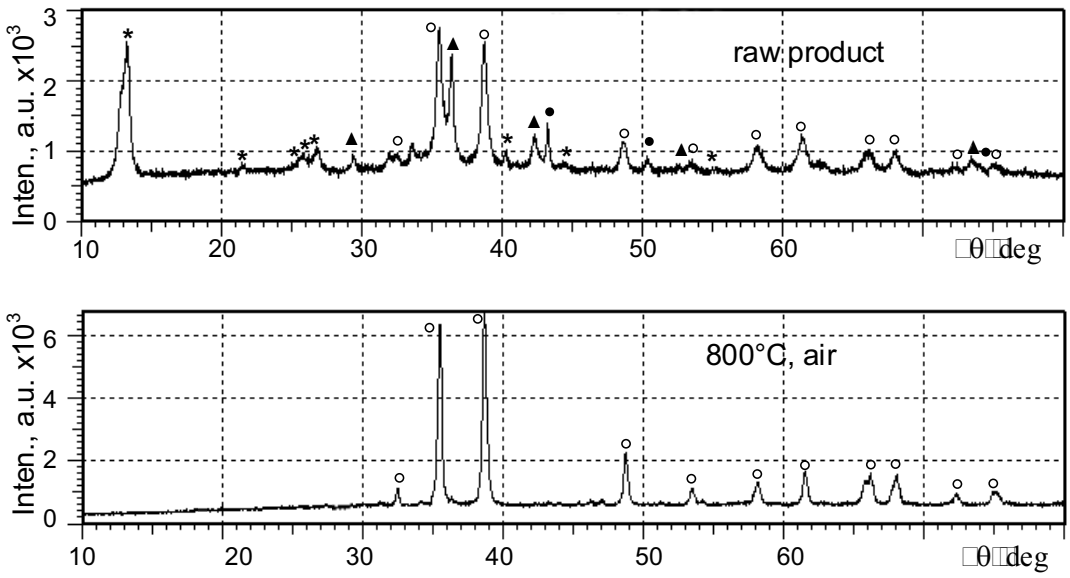

Fig. 1. X-ray diffraction patterns of the synthesized material
● Cu; ▲Cu_2O; ○ CuO; * $Cu(OH)_2 \cdot H_2O$

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