

## **The synthesis of micro and nanodiamonds by oxygen-acetylene torch method**

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In recent years, nano- and micro-diamonds have been used in many scientific and technical fields. High mobility of electrons, field electron emission and magnetic properties make it possible to use them in electronics. The simplest but effective methods for obtaining nano- and micro-diamonds include method of oxygen-acetylene torch, in which precipitation occurs at atmospheric pressure, i.e. no complicated vacuum and electronic equipment is required. This technology has several advantages over other methods, such as high synthesis speed, simplicity and low cost of used equipment.

Monocrystalline silicon plates were used as substrates and bases for copper films. Copper films were deposited on substrates of polished silicon wafers by magnetron sputtering at a direct current in the VUP-5M installation.

A series of experiments in which the distance from the torch nozzle to the substrate ( $h = 4$  mm) and the tilting angle of the flame front ( $\alpha = 90^\circ$ ) was constant was carried out. The duration of deposition was changed from 15 to 45 minutes in 15 increments. The concentration ratio of oxygen and acetylene was varied from 0.88 to 0.94 in 0.01 increments.

Raman, FESEM and XRD methods were used to investigate the character of these nanostructures in more detail.