

Determination of the diamond content in the detonation products of explosive

Gavrilova V.C.¹, Janchuk I.B.², Svirid E.A.*¹, Efanov A.V.²

¹*V.N. Bakul Institute for Superhard Materials NASU, Ukraine*

²*V.E. Lashkarev Institute of Semiconductor Physics NASU, Ukraine*

**e-mail: sviridkat@rambler.ru*

Currently, the ultradispersed diamond (UDD) powders synthesized in the shock waves from explosives are widely used. A separation of UDD from the synthesis product is quite complex and time-consuming process. Purification of metal impurities and removing non-diamond carbon are the main stages of this process. A test of the purification degree of UDD and identification of impurities, especially impurities of carbon, which forms the amorphous structures, are no less complex.

In this paper, the studies of diamond content in the UDD synthesis product purified from metallic impurities are presented. Relations of sp^2 and sp^3 - hybridized carbon in the samples with various concentrations of diamond were determined by Raman spectroscopy.

Initially, the synthesis product powder was purified from metal impurities. Then removing non-diamond carbon was carried out by treating the powder in the strong liquid-phase oxidants. In the first stage, the diamond content in powder was determined from the decrease in the mass of powder after the treatment.

The obtained data correlate with the number of sp^2 and sp^3 - hybridized carbon in the product.

The relative error in determining the content of diamond in the product by reduce its mass during treatment is less than 5%.