CONDENSED CARBON IN THE DETONATION PRODUCTS OF MIXED COMPOSITIONS BASED ON BTF

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The study presents microscopic and diffraction investigations of detonation carbon in diamond and graphite phases from explosive compositions based on benzotrifuroxane (BTF), containing both inert additives and other explosives.

It was found that the formation of nanodiamonds and carbon in the graphite phase from component BTF occurs at the scale of its granules, ranging from a few microns to tens of microns. According to high-resolution transmission electron microscopy (HRTEM), the detonation carbon of samples, in which the presence of BTF granules of this size was determined using scanning electron microscopy, represents a mechanical mixture of condensed detonation products or thermal decomposition components. For the BTF-hexogen mixture in equal mass proportions, this result is also confirmed by X-ray phase analysis data. The corresponding diamond reflection has a broad base and a narrow peak, indicating the presence of several characteristic sizes of diamond particles observed in pure BTF and hexogen.

When the initial explosive components were mixed at the submicron level, detonation carbon characteristic to pure BTF is not observed in either the graphite or diamond phases. The condensed detonation products do not looks like as a mechanical mixture of detonation carbon from the individual components of the explosive mixture.

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