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Evolution of Shock Waves in Silicon Carbide Rods IGOR BALAGANSKY, ALEXEY BALAGANSKY, Novosibirsk State Technical University, K. Marx Ave, 20, 630092, Novosibirsk, Russia, SERGEY RAZORENOV, ALEXANDER UTKIN, Institute of Problems of Chemical Physics, 142432, Chernogolovka, Moscow Region, Russia — Evolution of shock waves in square rods made of silicon carbide has been investigated. Several experiments were conducted to measure shock wave profiles in ceramic rods. Square rods made of self-bonded silicon carbide were used; rod thickness was 20 x 20 mm, rod length – 20.0, 40.0, 77.5 mm. Density of the samples was 3.08 g/cm^3, porosity – less than 2%. The value of Hugoniot elastic limit was estimated at 10 GPa. Shock waves in the rods were initiated by detonating a stabilized RDX high explosive charge 40 mm in height, 40 mm in diameter, and density of 1.60 g/cm^3. Manganin gauges were used to measure the pressure profiles. Propagation of shock wave along the ceramic rod was also investigated using a rotating mirror camera. Analysis of the results allows drawing the following conclusions. It has been observed that the propagation velocity of compressed impulse is constant along the length of ceramic rod, and amounts to 11.0 km/s, which equals to elastic wave velocity in the rod. Strong fuzziness of the wave front is observed, which conforms to theoretical conception of impossibility of shock wave existence in a finite size elastic body. The phenomenon of fuzziness of the wave front may be used for desensitization of heterogeneous high explosives.

Igor Balagansky
Novosibirsk State Technical University

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