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Influence of structure and orientation of graphite on its polymorphic transformation under shock compression GALINA S. BEZRUCHKO, Institute of Problems of Chemical Physics of RAS, Chernogolovka, Russia, GENNADY I. KANEL, Joint Institute for High Temperatures of RAS, Moscow, Russia, SERGEY V. RAZORENOV, ANDREY S. SAVINYKH, IPCP RAS, VLADIMIR V. MILYAVSKIY, KONSTANTIN V. KHISHCHENKO, JIHT RAS — Measurements of the transition pressure and rate under shock compression of different graphites at different sample orientations have been carried out with the goal to verify possible mechanisms of the graphite-diamond transformation. The materials tested were highly ordered synthetic graphite plates and samples prepared by pressing of powders of highly ordered pure graphite and several kinds of natural graphite. In experiments the VISAR wave profiles were measured using the LiF windows in the transformation pressure region. It has been found the shock direction significantly affects the detected pressure of the transformation and its rate. Results of the measurements show that means shifts in basal planes complicate high-rate graphite–diamond transformation. The effect is more pronounced in more ordered graphite. It was found also the transformation pressure increases and the transformation rate decreases as the degree of three-dimensional ordering of graphite decreases. Content of rhombohedral phase (up to 30%) does not much influence on the transformation parameters.

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