

Abstract Submitted
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Experimental investigation of shock-wave processes in solid and liquid paraffin ALEXANDER UTKIN, VASILIIY SOSIKOV, IPCP RAS — Paraffin response to shock-wave stressing at transition through melting temperature have been researched. The homogenized paraffin and docosane ($C_{22}H_{46}$) were investigated at initial temperature of 20 and 70 °C. Compression pulse amplitude was changed from 0.2 to 2 GPa. Registration of free surface velocity was made with VISAR laser interferometer. It was shown that phase transition of paraffin from solid to liquid state does not lead to appearance of any features on wave profiles. Spall strength remains constant and it is equal to about 25 MPa independent to state of sample. Significantly different results were achieved in experiments with docosane. In liquid phase velocity profiles are similar to paraffin but the spall strength is higher and equals to 40 MPa. In solid state the spall strength halves, and dramatic change of compression pulse structure is observed. If in liquid phase shock jump forms, then in solid state two wave configuration is recorded. Moreover the front of compression pulse expands during propagation. It means that solid docosane has an elastic property which leads to formation of forerunner and its compressibility is anomalous at low pressures.

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