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Shock wave-droplet interaction HAMED HABIBI KHOSHMEHR, ROUSLAN KRECHETNIKOV, University of Alberta — Disintegration of a liquid droplet under the action of a shock wave is experimentally investigated. The shock wave-pulse is electromagnetically generated by discharging a high voltage capacitor into a flat spiral coil, above which an isolated circular metal membrane is placed in a close proximity. The Lorentz force arising due to the eddy current induced in the membrane abruptly accelerates it away from the spiral coil thus generating a shock wave. The liquid droplet placed at the center of the membrane, where the maximum deflection occurs, is disintegrated in the process of interaction with the shock wave. The effects of droplet viscosity and surface tension on the droplet destruction are studied with high-speed photography. Water-glycerol solution at different concentrations is used for investigating the effect of viscosity and various concentrations of water-sugar and water-ethanol solution are used for studying the effect of surface tension. Here we report on how the metamorphoses, which a liquid drop undergoes in the process of interaction with a shock wave, are affected by varied viscosity and surface tension.

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