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Shock-Induced Polarization in Distilled Water YURI SKRYL, Institute of Mathematics and Computer Science, University of Latvia, Latvia, ANNA BELAK, Virginia Polytechnic Institute and State University, Blacksburg, VA, MAIJA KUKLJA, National Science Foundation, DMR/MPS, Arlington, VA — This study is aimed at developing a theoretical model to describe shock-induced polarization in water. The model is based on the notion that polar water molecules tend to align in the shock front due to inertial and stress forces. Analytical formulas for calculation of the shock-induced polarization charge, potential generated by this charge, and accompanied polarization current produced by the shock wave are derived. A comparison with experimental curves for polarization currents suggests that two factors contribute into the measured polarization signal: change of the polarization charge once the wave front enters the sample and change of the sample capacity while the front is progressing across the sample. Good agreement with experimental data on polarization in distilled water leads us to believe that the results obtained bring about a better understanding of mechanisms of shock induced polarization in liquids containing polar molecules.

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