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Shock Induced Polarization in Binary Electrolytes 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, Arlington, VA, 22230, USA —
This study is aimed at explaining strong polarization in shock-compressed aqueous solutions of KF. An original computational method is developed for modeling the charge transfer and accompanied changes of the electric field. Zeldovich's idea of bi-component diffusion of plasma is used as a main mechanism for shock-induced polarization. As a result of this modeling, charge distribution maps as well as electric field potentials in a sample are calculated for various amplitudes of the shock wave. It was found that large potentials introduced in shock-compressed electrolytes can be mainly explained by enhanced diffusion, strong ionic solvation, and change of water permittivity induced by a shock wave. More so, a sign of EMF generated is a strong function of interplay between stress-assisted and inertial diffusion mechanisms. The results obtained bring about a better understanding of mechanisms of shock-induced polarization in liquids.

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