

ABSTRACT

A study of the charge mobility phenomenon of organic semiconductor materials using the dimensional analysis method has been implemented. The value of charge mobility was obtained with the help of regression from the application of the analytical method of analysis of the reference model. The reference model used is the Extended Gaussian Disorder Model (EDGM). The model brings the effect of charge density as a function of charge. In theory, charge mobility in organic semiconductors is a hopping transport in an disordered system with a Gaussian energy distribution. The results show that the numerical model resulting from dimensional analysis shows Arrhenius, Poole-Frenkel, and non-Arrhenius dependencies that are in accordance with the reference model. The resulting charge mobility values have a good level of accuracy when compared to the reference model. In the electric field variation, the largest tolerance values obtained were 0.8427% and 1.2748%. In the variation of charge density, the largest tolerance values obtained were 2.7425% and 3.7445%. At temperature variations, the largest tolerance values obtained were 2.0978% and 1.7016%. Thus, the application of the dimensional analysis method to the charge mobility phenomenon yields good results.

Keyword: *charge mobility, organic semiconductor, dimensional analysis*