Prediction of Optical, electrical and thermal properties for a composite of tetmeth_bisphen_carbonate and nylon66

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Abstract: A computational study has been done to predict Optical, electrical and thermal properties of a polymer composite consisting of tetmeth_bisphen_carbonate and nylon66. Synthia module of Biovia Materials Studio software was used to predict Refractive index, Volume resistivity, Dielectric constant, Coefficient of volumetric thermal expansion and Thermal conductivity of the composite.

Objective: In this study the effect of mixing of tetmeth_bisphen_carbonate and nylon66 on the following properties have been predicted.

a. Refractive index

b. Volume resistivity

c. Dielectric constant

d. Coefficient of volumetric thermal expansion

e. Thermal conductivity

The weight fractions of the monomers were varied in the range of 0 to 1.

Software used: Synthia module of Biovia Materials Studio software (Dassault Systemes, France) was used for the study.

Results and Discussion: The effect of weight fraction of tetmeth_bisphen_carbonate (Monomer 1) on the Optical, electrical and thermal properties of the composite has been presented in Table 1. The predicted properties of the composite for 0, 0.5 and 1.0 weight fractions of tetmeth_bisphen_carbonate have been summarized in Table 1. The rate of change for the properties have been summarized in Table 2.

Table 1. Properties of composite of tetmeth_bisphen_carbonate and nylon66

Property		Results for		
Name	Unit	0.0 weight fraction of tetmeth_bisphen_carbonate	0.5 weight fraction of tetmeth_bisphen_carbonate	1.0 weight fraction of tetmeth_bisphen_carbonate
Refractive index	0	1.513	1.542	1.572
Volume resistivity	Ohm-metre	11720750000000000.000	56776750000000000.000	324667800000000000.000

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