



THE STUDY OF THE EFFECT OF GRAPHENE OXIDE ADDITIVE ON THE THERMAL CONDUCTIVITY OF EPOXY COMPOSITES

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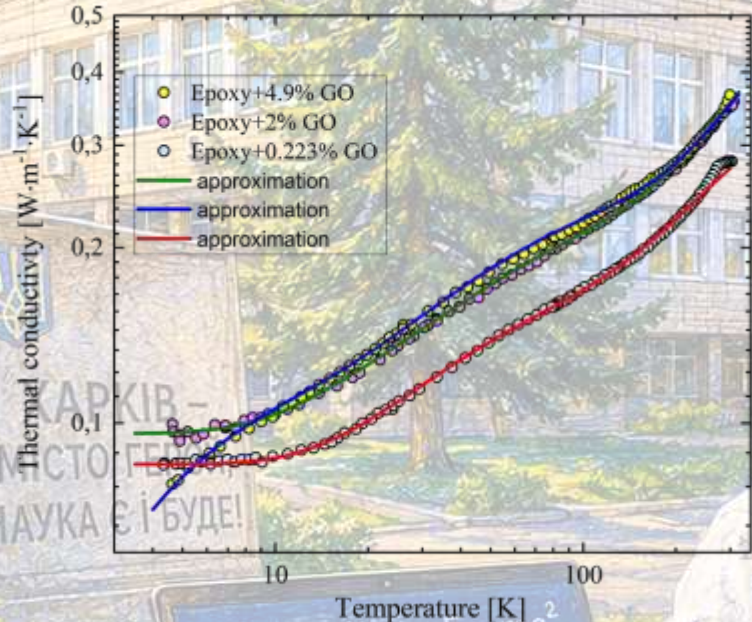


Fig. 1. Temperature dependences of thermal conductivity of GO-filled epoxy resin with different percentages of GO. The lines show the approximation dependences with the parameters from Table 1, according to Expression:

$$\kappa(T) = \kappa_{pr} + \kappa_{dij} = \kappa_{pl} + \kappa_{01} \times \exp(-E_1/T) + \kappa_{02} \times \exp(-E_2/T) + \kappa_{03} \times \exp(-E_3/T)$$

Substance	κ_{pl} , $W \cdot m^{-1} \cdot K^{-1}$	κ_{01} , $W \cdot m^{-1} \cdot K^{-1}$	E_1 , K	κ_{02} , $W \cdot m^{-1} \cdot K^{-1}$	E_2 , K	κ_{03} , $W \cdot m^{-1} \cdot K^{-1}$	E_3 , K	ΔT , K
Epoxy+0.223% GO	0.085	0.118	40	0.346	420	-	-	3.5-320
Epoxy+2% GO	0.096	0.114	27	0.074	100	0.75	600	3.5-320
Epoxy+4.9% GO	-	0.136	2.6	0.149	50	0.86	675	3.5-320

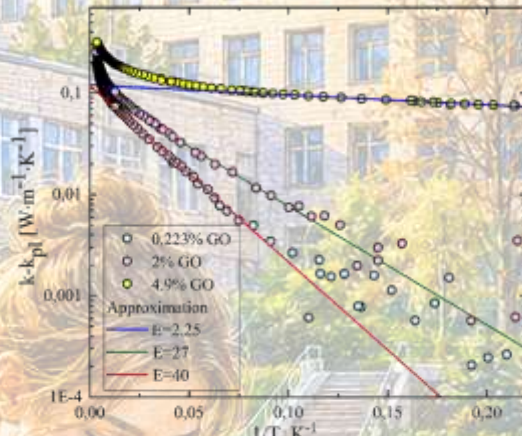


Fig. 2. Linear representation of the temperature dependence of the coherent contribution to thermal conductivity, $\kappa_0 \exp(-E/T) = \kappa(T) - \kappa_{pl}$, as a function of inverse temperature for three investigated composite samples.

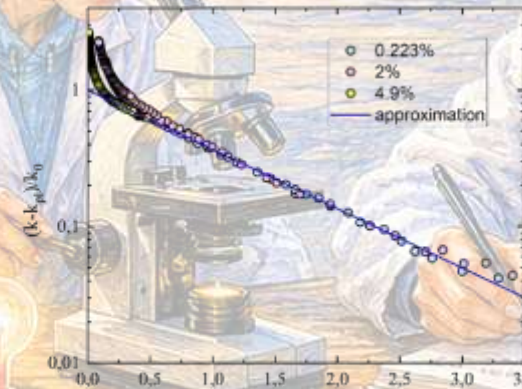


Fig. 2. The reduced temperature dependence of the thermal conductivity $(\kappa(T) - \kappa_{pl})/\kappa_0$ on the reciprocal reduced temperature, which illustrates the universal nature of the thermal conductivity of composites according to the Arrhenius-type dependence $(\kappa(T) - \kappa_{pl})/\kappa_0 = \exp(-E/T)$.

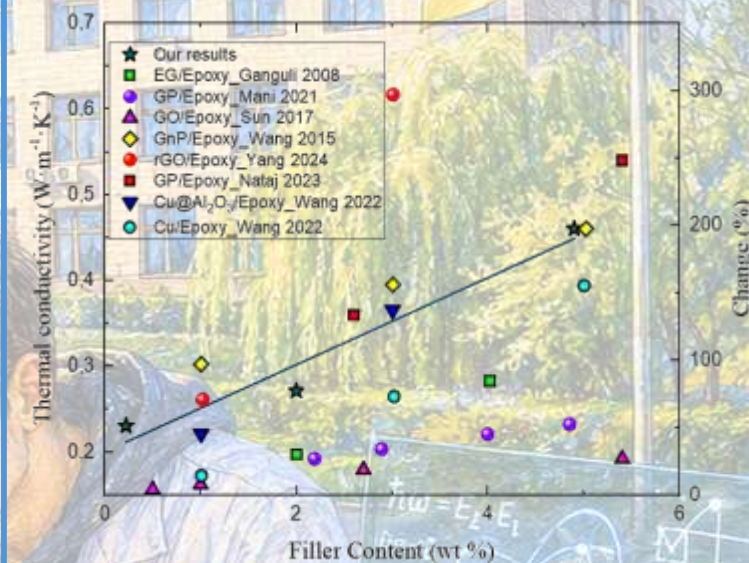


Fig. 4. Comparison of the thermal conductivity of the epoxy/GO composite with previously reported epoxy-based composites in the literature.

References

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