Kinetics of non-isothermal crystallization of ternary \( \text{Se}_{80}\text{Te}_{20-x}\text{Zn}_x \) glasses

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**Abstract**

The crystallization kinetics of \( \text{Se}_{80}\text{Te}_{20-x}\text{Zn}_x \) with \( x = 0.5, 1.0, 1.5, 2.0 \) and \( 2.5 \) chalcogenide glasses were investigated using non-isothermal crystallization approach. The glass transition temperature (\( T_g \)) and crystallization temperature (\( T_c \)) of these glasses were determined using the differential scanning calorimeter at different heating rates. The dependence of \( T_g \) and \( T_c \) on the heating rate (\( \beta \)) has been used for the determination of the activation energy of crystallization (\( E_c \)), the activation energy of structural relaxation (\( E_t \)), crystallization enthalpy (\( \Delta H_c \)) and the Avrami exponent (\( n \)). It was found that the enthalpy released is minimum at 2.5% of Zn, hence, the glass with 2.5% of Zn is most stable in the \( \text{Se}_{80}\text{Te}_{20-x}\text{Zn}_x \) system. The crystallization kinetics for the glasses was studied by using the modified Kissinger and Ozawa equations.