ABSTRACT

The production of an excess amount of heat within the system, as dictated by the degree of spontaneity of the process, endothermic or exothermic, creates a controllable amount of thermal entropy (the configurational entropy being of negligible contribution if the phase to be formed is of the ordered type) while elevating the instantaneous temperature of the system to a temperature higher than the processing temperature (i.e., the temperature of the heat reservoir) which in turn raises instantaneously the thermal energy which is carried by each atom. This effect enhances the kinetics of any transformation which is bound to take place, given that it is thermodynamically favored, while allowing the processing temperature to be kept as low as possible thus avoiding higher temperature treatments which will endanger the stability of the phase to be formed.

Keywords: czts kesterite phase, non-equilibrium thermodynamic process