

THE EFFECTS OF TEMPERATURE ON THE RATE OF CRYSTALLIZATION

The rate of crystallization is a function of temperature. It is generally found that the rate increases with increasing temperature up to a certain point, after which it decreases. This is due to the fact that at higher temperatures the mobility of the polymer chains is increased, and they are able to move more readily into the crystalline phase. However, at very high temperatures the thermal energy is so great that the chains are unable to maintain the ordered structure of the crystal lattice, and the rate of crystallization decreases.

The rate of crystallization is also affected by the presence of impurities. Impurities can act as nucleating agents, increasing the rate of crystallization. They can also act as inhibitors, decreasing the rate. The effect of impurities depends on their nature and concentration. Some impurities, such as certain metal ions, are known to be effective nucleating agents for many polymers.

Another factor which affects the rate of crystallization is the size of the crystallites. It has been found that the rate of crystallization is inversely proportional to the size of the crystallites. This is because smaller crystallites have a larger surface area per unit volume, and the rate of crystallization is proportional to the surface area. Therefore, the rate of crystallization is higher for smaller crystallites.