Role of Glass Fiber on the Crystallization of Poly(Ether Ether Ketone)

The isothermal quiescent and flow-induced crystallization of poly(ether ether ketone) (PEEK) has been investigated using fast scanning calorimetry (FSC) and oscillatory shear rheometry. We extended our work on the crystallization of PEEK and focused on glass fiber reinforced PEEK composites.

FSC data indicate that the presence of glass fiber in the PEEK melt inhibits the quiescent crystallization kinetics, perhaps from a steric hinderance effect of glass fiber. Small-amplitude oscillatory time sweep results suggest that with shear flow, the presence of glass fiber accelerates the crystallization of PEEK. A correlation to specific work was explored.

With a refined understanding of the effect the applied work has on the crystallization of PEEK and glass fiber reinforced PEEK, improved models are developed for the isothermal crystallization, with and without prior shear flow. These models can be used to predict the rate of crystallization of PEEK and its glass fiber composites relevant for commercial application in industry.