Surface tension of polymer melts - experimental investigations of its effects on polymer-polymer adhesion.

The surface tension of polymer melts is important for the bond strength of two component polymer parts through their roles in the process of wetting, adsorption and adhesion. This investigation deals with the influence of the melt surface tension and substrate surface energy on the polymer-polymer bond strength during two component polymer processing. Polymer materials PS, POM, ABS, PEI, PEEK and PC are chosen for the investigation. Pendant drop method showed that in case of PS and POM, the melt surface tension was decreased with increasing temperature. The substrate surface energies of the materials were determined at various temperatures and the results showed that the surface energy of the polymer substrate was decreased with the increased temperature. This indicates that a higher substrate temperature does not improve the wetting of the second polymer on to the substrate surface. The results and discussion presented in this paper reflect the temperature dependent behaviours of the surface tension and surface energy of polymers and their effects on the polymer-polymer bond strength.

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