Temperature Effect On Impact Properties Of Denture Base Acrylic Material

By

M Shehata, A. EI AssaI & Z EI Shorbagy

Associate Professor, Dental Materials Dept. Faculty of Dentistry. Tanta University Associate Professor. Production Engineering Technology, Benha High Institute of Techno logy Professor & Head of Prosthodontics. Faculty of Dentistry. Tanta University

ABSTRACT

This work is devoted to explore the behavior of a Widely used denture base material during impact loading under different temperatures. Eight different groups of standard Izod impact testing specimens were tested at different temperatures. The chosen temperatures (0, 10, 18. 28. 45, 55. 70° C) were chosen to cover a wide range similar to actual service temperatures. All specimens were soaked in distilled water at the designated temperatures in order to gain the temperature. One hour and two hours were chosen as the time for soaking and the results of both were recorded. The results did not show a clear transition temperature similar to metals. However, a slight increase of fracture energy was developed with the increase of temperature then followed by a decrease in fracture energy with further increase of temperature. An explanation of fracture energy increase is due to the increase of internal frictional resistance of polymer chains movement due to the impact load. This movement becomes easier at higher temperatures. which contribute to a decrease in fracture energy with further increase in temperatures also, the same tests were repeated with specimens with formed notches. These specimens showed a higher increase in fracture energy compared with the cut notch specimens.