Li J-J, M.E.Sc., "Evaluation of Different Dental Materials Using a Slugging Fluidized Bed", The University of Western Ontario, December 1999 (co-supervisors: AS Bassi and S Hatibovic-Kofman).

Abstract

Because of the large number of commercial dental restorative materials that continue to be introduced, there is an obvious need for testing dental materials on their wear resistance. A simple but reliable special method was developed for in vitro evaluation of the wear characteristics of dental restorative materials in a gas-solid fluidized bed under slugging operation regime.

A preliminary test on the wear of the dental materials was carried out in a room temperature fluidized column with a cross-section of 76 mm and a height of 0.91m. A stainless beam was fixed horizontally crossing the axis of the column at 0.39 m above the air distributor. The packed bed height was kept constant at 0.34 m for all tests to ensure comparability. Due to bed expansion, the specimens were covered by the particles when fluidized. The parameters tested were particle size (200 m m to 700 m m), different particles, superficial air velocity (0.25 m/s to 0.992 m/s) and different dental restorative materials.

The additional experiment was carried out in the same column under the base operation condition (superficial air velocity = 0.464 m/s; particle size = 400 m m) with more different types of dental materials. The hardness of each material was tested to find out if the wear of the material can be simply predicted by the hardness value.