

17th International Conference and Exhibition on NANOMEDICINE AND NANOTECHNOLOGY IN HEALTHCARE

November 23-24, 2017 Melbourne, Australia

Effect of colloidal nano-silica on setting time, radiopacity and physical properties of a nano cement based compound for endodontic applications

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Long setting time is one of the main disadvantages of cements in endodontics procedures. The main objective of this study is to decrease the setting time of a nano cement based compound (NCBC) (similar materials to white mineral trioxide aggregate). Accordingly, colloidal nano-silica instead of distilled water were added to NCBC and its effect on setting time, radiopacity, compressive strength, flexural strength were measured and analyzed. The initial and final setting times were measured using the Gilmore apparatus according to regulations of American Dental Association specification no. 57 and American Society for Testing and Materials Specification C266- 03. The compressive and flexural strength were determined using a Universal testing machine with a crosshead speed of 1 mm/min. The radiopacity of NCBC samples were also determined and expressed in mm Al equivalent thickness. The results suggest that NCBC setting time can be decreased by addition of colloidal nano-silica. Moreover, it has positive impact on the compressive and flexural strength properties.

Biography

Mohammad Reza Sanaee has completed his Masters and PhD in Nano-science and Nano-technology at the University of Barcelona, Spain. He has obtained Postdoctoral Fellowship from Iranian National Elite Foundation in 2016 and since then working at Shiraz University, Iran. His research activities are in the area of magnetic nanoparticles, carbon based materials and also nano-composites for dental applications.

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