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### Hardness assessment of new modified glass ionomer cement nanosilica-hydroxyapatite-zirconia composite using one-pot technique

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Glass ionomer cement is among the commonly used material in dentistry but has some limitation such as low hardness and wear resistance which has trigger researchers to modify its powder composition. One-pot synthesis method was used to prepare new nanopowder hybrids of nanosilica-hydroxyapatite-zirconia (nanoSi-HA-Zr). This new nanopowder hybrid was added into commercial available conventional glass ionomer powder (Fuji IX, GC, Japan) at weight percentages of 1%, 3% and 5% by spatulation at controlled grinding process to produce GIC-nanosilica- hydroxyapatite-zirconia (GIC-nanoSi-HA-Zr). Vickers hardness of the new composite were assessed and compared with the Fuji IX and GIC-nanoSi-HA (GIC-nanoSi-HA) hybrid. In general, results showed that the hardness of GIC-nanoSi-HA-Zr composite was higher than Fuji IX and GIC-nanoSi-HA composite. The highest hardness values recorded is at 3% addition for GIC-nanoSi-HA-Zr which is ~75 HV ( $\pm 2.48$ ) compared to ~51 HV ( $\pm 4.45$ ) Fuji IX and ~56 HV ( $\pm 6.67$ ) GIC-nanoSi-HA. It could be concluded that incorporation of nanozirconia significantly improves the hardness of conventional glass ionomer and also GIC-nanoSi-HA.

### Biography

Wan Zaripah Wan Bakar has graduated in 1992 and served the Ministry of Health, Malaysia for 9 years. She has completed Graduate Diploma in Clinical Dentistry in 2003, Doctor of Clinical Dentistry in 2006 from University of Adelaide, Australia and is also a Fellow of RACDS since 2004. In 2013, she did her Postdoctoral Research Fellow Program at the UTHSCSA, Texas, USA. She currently works as Senior Lecturer and Consultant Prosthodontist/Restoratives at Universiti Sains Malaysia, Malaysia. She has published more than 30 papers in reputed journals.

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