

Characterization of denture soft liner and modification with Si nanoparticles

This master deals with the characterization of a denture soft liner (Viscogel) and the possible improvement of its properties when Si nanoparticles are added.

Specimens were prepared with spincoating method, and measurements were conducted in 24h, 7 days and 28 days.

Properties investigation included topography, mechanics, crystallinity, wetting properties, optical properties and cytotoxicity which were performed with atomic force microscopy, optical microscopy, nanoindentation, X rays diffraction, contact angle measurement, spectroscopic ellipsometry and cellular cultivation.

In the same time it was considered that mucosal mechanical properties due to their clinical importance would be necessary to be compared with soft liners'.

Results have shown that soft liners don't have stable mechanical properties with time and are affected when wetted with oral saliva substitute.

Modification with Si nanoparticles seems to have positive impact on soft liner mechanical properties for the first 24h, but more research is needed on this field. Nanoparticles don't seem to influence other properties as hydrobobicity, optical properties and cytotoxicity while crystallinity is affected.

Soft liners perform a different mechanical behavior comparing with oral mucosa, which needs to be evaluated in new studies.

Finally, it should be notified that a more stable soft liner should be developed, eventually by means of modification with nanoparticles.