

# Assessment of the chemical composition in different dental implant types: An analysis through EDX system

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## Abstract

The use of dental implants has been increasing in the last years; however, their chemical composition is an important issue due to the fact that the implant surface may suffer a corrosion process, allowing the possibility of ions being released and resulting in a possible biological response. Thus, the aim of this study was to evaluate the morphological analysis of the surface and chemical composition of different implant types through an energy-dispersive X-ray spectrometry (EDX) system. Eight dental implant models from different manufacturers were analyzed using variable pressure scanning electron microscopy (VP-SEM) and EDX. The chemical composition and general characteristics of the structural morphology in different dental implant surfaces were analyzed randomly. Nitrogen was identified in two samples, while zirconium was observed in only one model. Aluminium was identified in five samples ranging between 4% and 11% of its composition. Regarding the morphological characteristics, two samples from the same manufacturer had the most irregular surface designed to increase the contact surface, while the others revealed their surfaces with roughness at the micrometric level with no major irregularities. In conclusion, despite the morphology of implants being similar in most of the analyzed samples, more than 50% of them, which are brands of implants available on the market, showed aluminium on the implant surface. Finally, STR (Bone level, Roxolid), DENT (Superline) and NEO (Helix GM) could be considered, among the analyzed samples, the safest implants from the point of view that no aluminium was detected in their chemical composition.

## Author keywords

Biocompatible materials  
Dental implants  
Electron  
Microscopy  
Scanning  
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X-ray emission