



P-C-1211

**INFLUENCE OF FLUORIDE ION ON TITANIUM BASED DENTAL ALLOY (NITI): AN IN VITRO STUDY**

W. RERHRHAYE<sup>a</sup>, L. BAHJE<sup>a</sup>, A. BALAMURUGAN<sup>b</sup>, F. ZAOU<sup>a</sup>, K. EL MABROUK<sup>b</sup>

<sup>a</sup> *Research team of biotechnology and biomaterials in buccal environment, Faculty of Dental Medicine, University Mohammed 5-Souissi, B.P. 6212, Rabat Instituts, Rabat, Morocco and* <sup>b</sup> *INANOTECH, Institute for Nanomaterials and Nanotechnology. MASciR, Moroccan for Advanced Science, Research and Innovation Foundation. Av. De l'Armée Royale, Madinat El Irfane 10.100, Rabat, Morocco.*

Titanium and titanium-based alloy are chosen for dental application due to their resistance to corrosion and their biocompatibility. Titanium based alloys have high corrosion resistance due to their passivity, form a thin, stable oxide layer on its surface. Similarly, in orthodontics, NiTi (nitinol) memory alloys are also widely used since they possess unique properties, such as shape memory effect, superelasticity and good biocompatibility. Currently, they are widely and successfully used as orthodontic wires. However, like other metallic biomaterials, the corrosion effect of NiTi alloys affects their biocompatibility and biofunctionality, which are two absolute requirements for ideal metallic biomaterials. For the purpose of maintaining oral hygiene fluorides are widely introduced into the oral environment by means of therapeutic dental products. Additionally, systemic fluorides may be ingested orally through tea, dietary supplements etc. Therefore, NiTi orthodontic wires are readily exposed to fluoride medium leads to corrosion. It has been clearly shown that Ni ion release, due to the corrosion process, which can lead to the mechanical failure of the orthodontic wires. In order to study the systemic effect of fluoride ions on NiTi alloy potentiodynamic and cyclic polarization measurements were performed in a series of defined solutions such as Ringers and fluoridated solution. The NiTi wires were evaluated for their mechanical stability before and after exposing the wires into fluoridated medium. The corrosion products and the surface morphology of the orthodontic wires were examined to predict its suitability for dental applications.