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Influence of temperature and pH on corrosion resistance of ni-cr and co-cr dental alloys

T Saleh¹, N Thovhogi², L Kotsedi³, D Gihwala³ and M Maaza³

¹Nanosciences African Network (NANOAFNET), South Africa

²iThemba LABS-National Research Foundation, South Africa

³Cape Peninsula University of Technology CPUT, South Africa

Dental alloys are used in applications that place them into contact with oral tissues for many years. Nickel-chromium (Ni-Cr) and Cobalt-chromium (Co-Cr) alloys continue to be an important part of dental restorative materials. It behooves those interested to study these alloys and develop an understanding of their chemical and physical characteristics. Many dental casting alloys which have good mechanical properties, on the other hand are not good enough from the aspect of corrosion because of their complex structure [1]. Organic acids, which are created after disintegration of food remains decrease pH value inside the oral cavity and may effect on ions release from dental alloys. Also, the materials used in the mouth must resist the humidity and the changes in temperature inside the mouth, which happens during the chewing process inside the mouth[2]. The aim of the study was to evaluate the influence of temperature and pH on corrosion resistance of Ni-Cr and Co-Cr dental alloys used for fixed and removable partial dentures, and surface analysis by scanning electron microscopy.

The dental alloys were purchased from Mountain Medico inc, USA were Ni-Cr and Co-Cr dental alloys tested in Fusayama-Meyer artificial saliva as reference solution, used in the study on at various different temperature and pH.

At the end of this: The study indicated that variation in casting morphologies by casting method has only marginal influence on the overall corrosion rate. The overall However, the corrosion resistance properties of Co-Cr alloy is was enhanced at various temperature and pH as compared to than that of the that of Ni-Cr alloy. Therefore, further studies need to be considered regarding the safety of these dental alloys for future dental application.

Keywords: Dental alloys, Artificial saliva, Nickel-chromium, Cobalt-chromium, Corrosion resistance, pH measurements, Temperature.

Tsaleh@tlabs.ac.za

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