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**THE EFFECT OF ALLOYING ELEMENTS ON THE BIOLOGIC SAFETY OF DIFFERENT NI-CR DENTAL MATERIALS FOR PROSTHODONTIC RESTORATION**

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**Keywords:** dental materials, Ni alloys, corrosión, EIS

**Abstract:** There are many alloys available for prosthodontic restorations and among them nickel-based alloys are widely used in the porcelain-fused-to-metal and casting crown and bridge. This is due to their simple fabrication process, low cost and, not less important, to their corrosion resistance. Even the nickel-chromium alloys form a thin protective oxide film on the surface, they show unstable galvanic corrosion [1] and also they corrode in physiological solutions such as balanced salt, human saliva, artificial saliva and artificial sweat solutions [2]. Despite all these, the use of Ni-Cr dental alloys is increasing. Many types of Ni-Cr alloys are found in the world markets and contain Fe, Mo, Mn, Cu, Nb, Al and Si in their composition. The present paper made a comparative study of six NiCr dental alloys: Wiron NT, Wirloyloy and Heraenium (Germany), Verasoft (USA) and Nicromal Soft and V (Romania) using microstructure analysis, Open Circuit Potential ( $E_{oc}$ ), Potentiodynamic Polarization, and EIS technique, coming to the following conclusions:

1. All alloys examined are under the influence of an anodic control, due to the formation of protective layers, most likely of oxide, on the surface of the alloys.
2. The alloys studied can be divided into two categories according to the type of corrosion observed. A uniform general corrosion behaviour that was found at the surface of the two Ni-Cr alloys Wiron NT and Heraenium, and a localized in points corrosion found in Ni-Cr alloys Wirloyloy, V, VeraSoft and Nicromal Soft.
3. In terms of susceptibility to corrosion, findings in this study show from the impedance spectra analysis that all alloys investigated have more than adequate corrosion resistance in Ringer solution, and the quantitative analysis on the polarization resistance ( $R_p$ ) of the Ni-Cr based alloys show that a higher corrosion resistance can be found in Ni-Cr alloys Nicromal Soft, Wirloyloy, Wiron NT and V.

**Selective references:**

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