ELECTRO-CHEMICAL BEHA VIOR AND SURFACE HARDNESS OF SELECTED COMMERCIAL TYPES OF DENTAL CHROMIUM ALLOYS

Mohamed M. Shehata *and Uthman M. Dawoud**

ABSTRACT

The aim of this study was to determine the corrosion behavior of commercial nickel-chromium and cobalt chromium alloys in different pH media. Also hardness tests were performed for surface mechanical properties evaluation. Two Ni-Cr (Ugirex-III and Wiron 88) and three Co-Cr alloys (Remanium 2000, Wironium & Wironit LA) were investigated by electrochemical technique (Potentiodynamic test) using potentiostat (HAG 5001) in o.g. mass % NaCI solutions of pHs 1.3, 4.4 & 7 at room temperature. Vickers hardness and Rockwell hardness were performed for these alloys. The three Co-Cr alloys revealed high corrosion resistance, especially, Remanium alloy at different pH solutions in comparison with Ni-Cl' alloys (Wiron 88, showed sever dissolution in any pH medium i.e it is the most corrodible alloy). The two Ni-Cr alloys showed lower hardness values than Co-Cr alloys. It was concluded that, harder Co-Cr alloys showed higher corrosion resistance than softer Ni-Cr alloys tested in this study. There may be a direct correlation between surface hardness property and corrosion resistance in general.

Associate Professor of Dental Biomaterials, Dental Materials Dept., Tanta University Tanta, Egypt.

Associate Professor, Chemical & Materials Engineering Dept, Faculty of Engineering, King AbduJaziz University, Saudi Arabia