THE INTERNATIONAL SYMPOSIUM ON MODERN ENGINEERING EQUIPMENT AND TECHNOLOGY

TISMEET 2025

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Las Palmas de Gran Canaria, Spain

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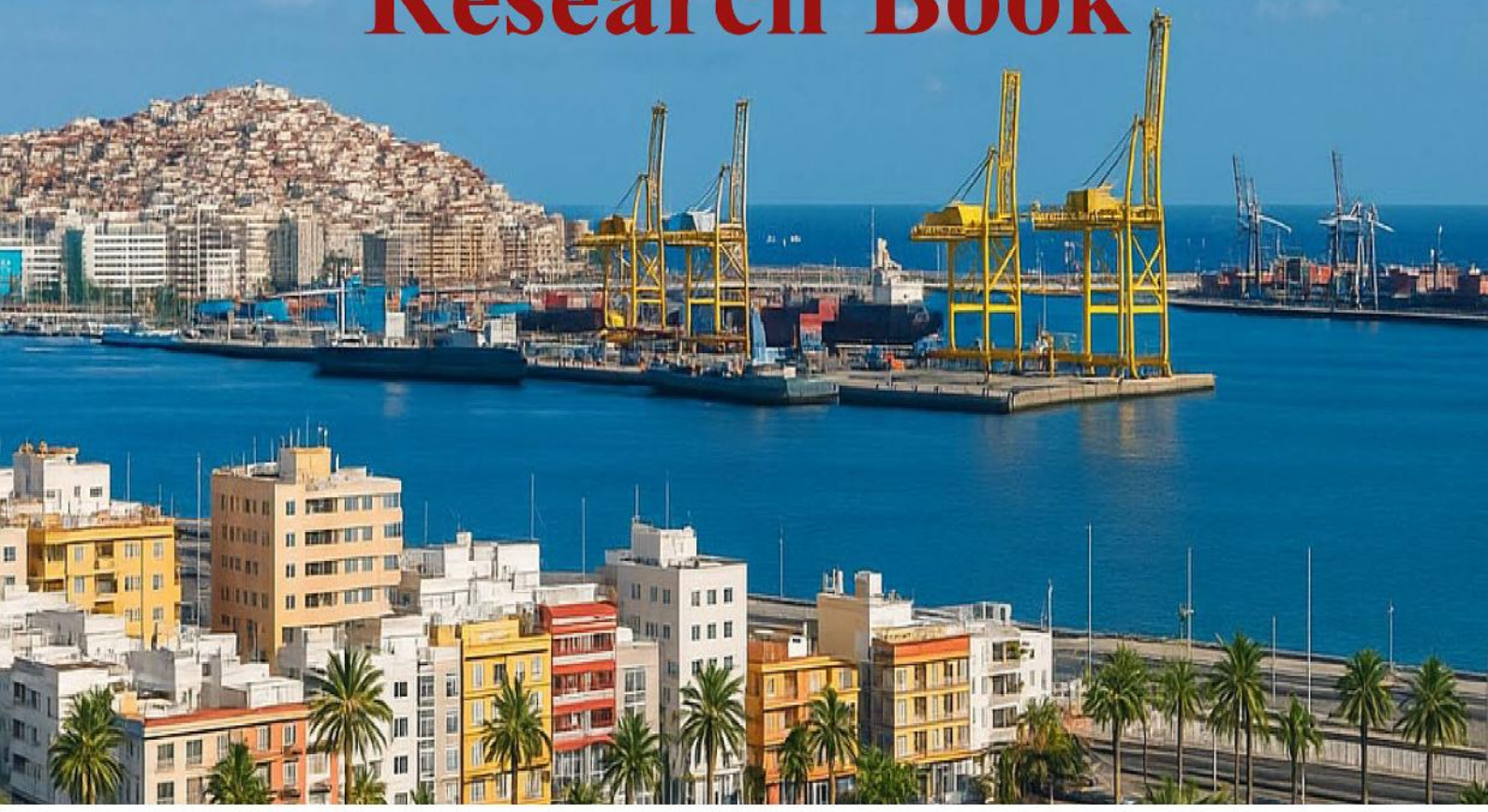

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Coordinadora: Julia Claudia Mirza Rosca

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2026

Colección **Congresos** y
Homenajes *Serie* **Congresos**

INTERNATIONAL SYMPOSIUM ON MODERN ENGINEERING EQUIPMENT AND TECHNOLOGY (2025. Las Palmas de Gran Canaria)
The International Symposium on Modern Engineering Equipment and Technology [Recurso electrónico] : research book : november 2-10, 2025, Las Palmas de Gran Canaria, Spain / coordinadora, Julia Claudia Mirza Rosca. -- Las Palmas de Gran Canaria : Universidad de Las Palmas de Gran Canaria, Servicio de Publicaciones y Difusión Científica, 2026
1 archivo PDF (XII, 61 p.) – (Congresos y homenajes. Congresos)

1. Ingeniería – Congresos y conferencias I. Mirza Rosca, Julia Claudia, coord. II. Universidad de Las Palmas de Gran Canaria, ed. III. Título IV. Serie

62(063)

Thema: TBC, 4CT.

The International Symposium on Modern Engineering Equipment and Technology

Las Palmas de Gran Canaria, Spain. November 2-10, 2025

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Universidad de Las Palmas de Gran Canaria
Servicio de Publicaciones y Difusión Científica
serpubli@ulpgc.es
https://spdc.ulpgc.es/

Primera edición [electrónica PDF], Las Palmas de Gran Canaria, 2026

Editorial:
Servicio de Publicaciones y Difusión Científica de la ULPGC

https://doi.org/10.20420/1831.2026.847

Producido en España. Produced in Spain.

Ni-Cr Dental Alloys Performance in Oral Physiological Conditions

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ABSTRACT

Metal alloys employed as biomaterials in contact with the human body necessitate thorough investigation to ensure their biocompatibility and absence of injury. The corrosion resistance of a dental material is the fundamental quality for its biological safety, as all problems originate from the corrosion process [1]. There is limited research on Ni-based dental biomaterials, and none has been identified in these dental materials utilized commercially artificial saliva. This research intends to explore the corrosion characteristics of six commercially used Ni-based alloys in artificial saliva [2]. The specimens were received as cylindrical ingots and were sectioned to provide five samples of each manufacturer, each having a cylindrical shape of 2mm in height for the study. This scientific investigation employed the following techniques: open circuit potential, potentiodynamic polarization tests, and electrochemical impedance spectroscopy. The study results indicated the passivation susceptibility of the various specimens. Furthermore, the comparison of materials revealed that chromium content was the critical determinant of superior corrosion resistance. Nonetheless, with comparable chromium content, the increased molybdenum concentration improved the resistance. The findings of this investigation indicated that the biological safety of the dental materials examined in Ringer solution was determined to be extremely high for two specimens and adequate for the remaining samples.

Keywords *— Nickel-based alloys; Metallic biomaterials; Corrosion; Dental materials; Artificial saliva*

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