EFC Event number 459

The annual event of the European Federation of Corrosion **EUROCORR 2020**

Closing the gap between industry and academia in corrosion science and prediction

EUROCORR
The European Corrosion Congress

Organized by

EFC EUROPEAN FEDERATION OF CORROSION
VOM BEYOND TREATMENT OF SURFACES
DECHEMA
VUB VRIJE UNIVERSITEIT BRUSSEL
UMONS
MATERIA NOVA Materials R&D Center

Welcome at the annual event of the European Federation of Corrosion EUROCORR 2020 website!

The main topic will be: "Closing the gap between industry and academia in corrosion science and prediction."

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see the invitation video below

EUROCORR SEPTEMBER 6-10, 2020
BELGIUM BRUSSELS
THE ANNUAL CONGRESS OF THE EUROPEAN FEDERATION OF CORROSION

EUROCORR 2020 Acceptance of your abstract submission Paper-ID 310597

Julia Claudia Mirza Rosca <julia.mirza@ulpgc.es>

Sáb 08/08/2020 11:42

Para: LUCERO BALDEVENITES <viviana.lucero@ulpgc.es>;

Dra. Julia Claudia Mirza Rosca
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DE GRAN CANARIA

De: eurocorr@dechema.de <eurocorr@dechema.de>
Enviado: viernes, 7 de agosto de 2020 13:39
Para: Julia Claudia Mirza Rosca <julia.mirza@ulpgc.es>
Asunto: EUROCORR 2020 Acceptance of your abstract submission Paper-ID 310597

Dear Ms Julia Mirza Rosca,

As you know Corona and Covid-19 has a major impact on our daily life and also on our EUROCORR conference. Currently, it is not quite sure if the EUROCORR 2020 can take place in Brussels.

The EFC is working intensively on transferring the EUROCORR 2020 into a virtual event which could take place if the situation in Brussels does not allow to meet there in September. In these days it is important that the EUROCORR community stays close together and EFC will provide in any case a platform for you that your contribution can be widely recognized by the community.

Nevertheless we have the pleasure to let you know that your submission has been accepted for a presentation at the EUROCORR 2020.

Title of the paper:
Biocompatibility of High Entropy Alloys: Science and Design

Final presentation form:
Poster

Final topic:
Corrosion Mechanisms, Methods and Modelling (3M, WP6 + 8)

We will keep you informed about the developments and I would like to take the opportunity to invite you to an EFC Webinar on Organic Coatings on May 20th, 14:00-16:00 h CEST.

https://zoom.us/j/95423126940?pwd=c1hkMnZhMHJWckxNWGIvdVdGL3VyZz09

This event will give you a first impression of how a virtual EUROCORR may look like.

Best regards
EUROCORR 2020 conference secretariat

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Biocompatibility of High Entropy Alloys: Science and Design

Néstor R. Florido Suárez[1], Viviana E. Lucero Baldevenites[1], Pedro P. Socorro Perdomo[1]
I. Voiculescu[2], V.Geanta[2], J.C.Mirza Rosca[1]
[1]University of Las Palmas de Gran Canaria, Spain
[2]Politehnica University of Bucharest, Romania

The special structure of high entropy alloys (HEAs) obtained by mixing equal or relatively large proportions of five or more elements, gives its excellent comprehensive performance. HEAs have superior properties that are unmatched by some conventional alloys as a new class of metallic biomaterials to meet future demands of the medical field. The pioneering efforts in obtaining the high entropy alloys (HEAs) created the groundwork for a new concept in alloy design by finding new equiatomic combinations of elements for advanced materials with unique properties.

In this study we investigate the effect of the presence of different elements on the HEAs properties in simulated body fluid (SBF). The microstructure, the hardness and the corrosion properties of high entropy alloys and their passive films were analyzed; the alloys were obtained by vacuum arc remelting from raw materials with high purity.

In order to analyze the passivation process, the electrochemical impedance spectroscopy technique at different potentials was used and the experimental results were compared with those obtained by potentiostatic and potentiodynamic techniques.

It resulted that the tested oxide films presented passivation tendency and a very good stability at local corrosion was detected. The mechanical data confirm the presence of an outer porous passive layer and an inner compact and protective passive layer. EIS confirms the mechanical results. The thicknesses of these layers were measured. SEM photographs of the surface and EDX profiles for the samples illustrate the appearance of a microporous layer.

The results emphasized that the surface treatment increases the passive layer adhesion to the HEA surface and improves the biocompatibility of the biomedical devices inducing the bone growth on the metallic surface.

Biocompatibility of High Entropy Alloys: Science and Design

Néstor R. Florido Suárez[1], E. Viviana Lucero Baldevenites[2], Pedro P. Socorro Perdomo[2], I. Voiculescu[2], V.Geanta[3], J.C.Mirza[2]

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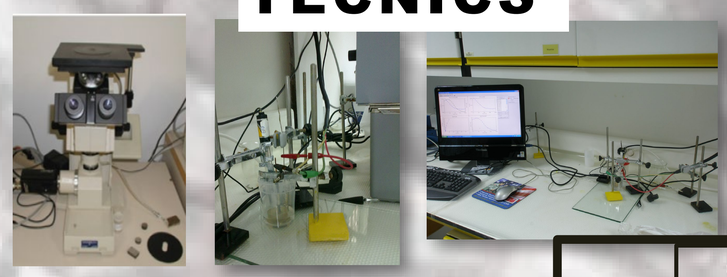
CHEMICAL COMPOSITION OF THE ANALYZED BIOHEA

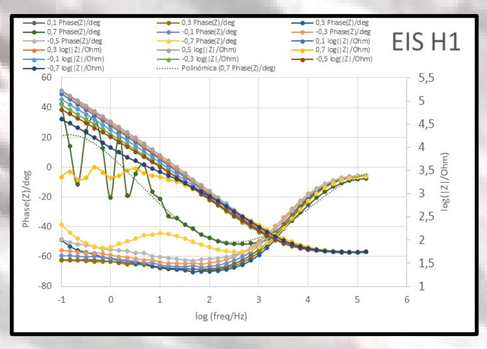
	Wt.%					
	Mo	Ta	Ti	Zr	Nb	Fe
BioHEA 1	20.45	32.45	12.67	18.97		15.46
BioHEA 2	17.32	38.95	13.21	17.45	13.07	

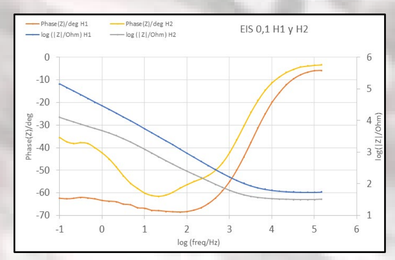
EQUIPMENTS

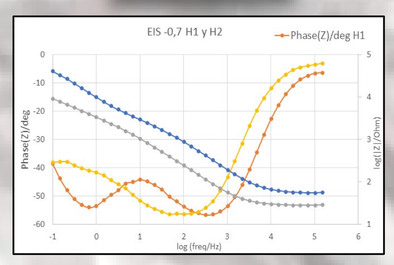
TECNICS

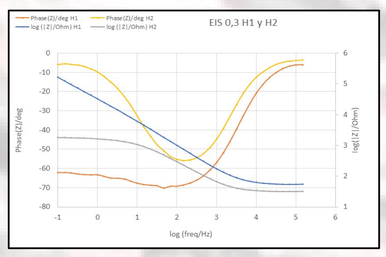


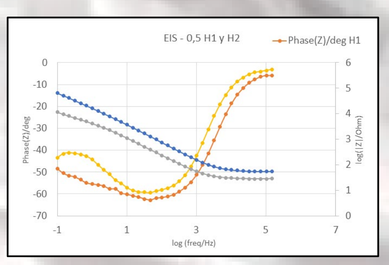
RESULTS

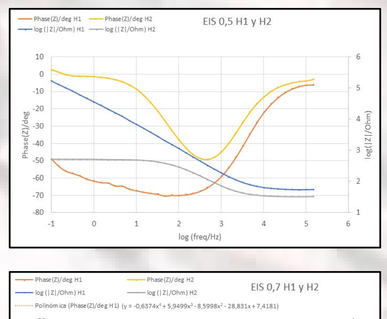


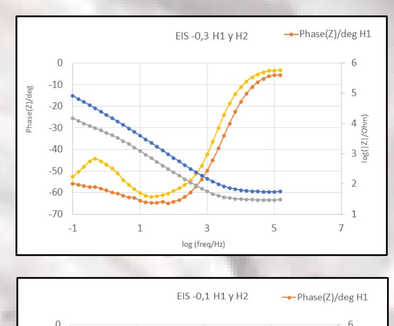


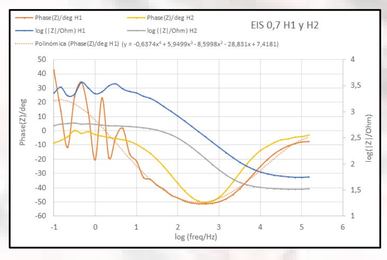


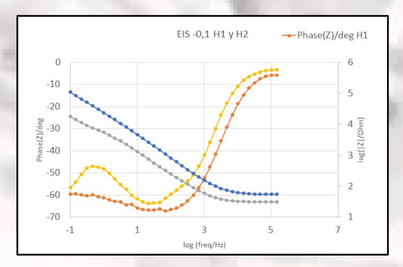


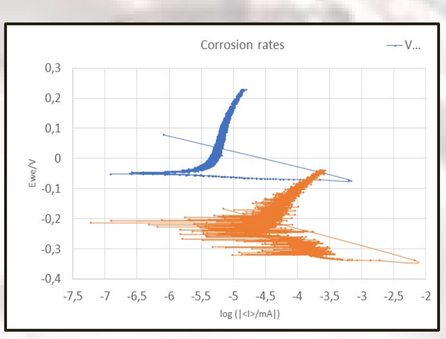


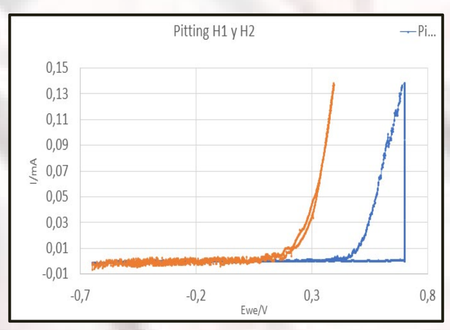


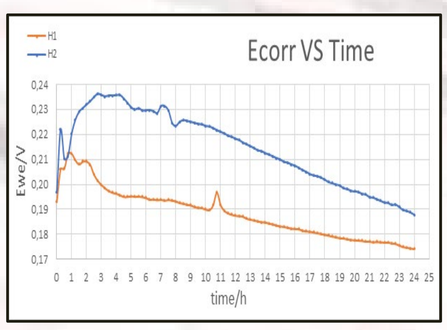












CONCLUSIONS

The effect of the presence of different elements on the HEAs properties in simulated body fluid (SBF). The microstructure, the hardness and the corrosion properties of high entropy alloys and their passive films were analyzed; the alloys were obtained by vacuum arc remelting from raw materials with high purity.

It resulted that the tested oxide films presented passivation tendency and a very good stability at local corrosion was detected. The mechanical data confirm the presence of an outer porous passive layer and an inner compact and protective passive layer. EIS confirms the mechanical results. The thicknesses of these layers were measured. SEM photographs of the surface and EDX profiles for the samples illustrate the appearance of a microporous layer.

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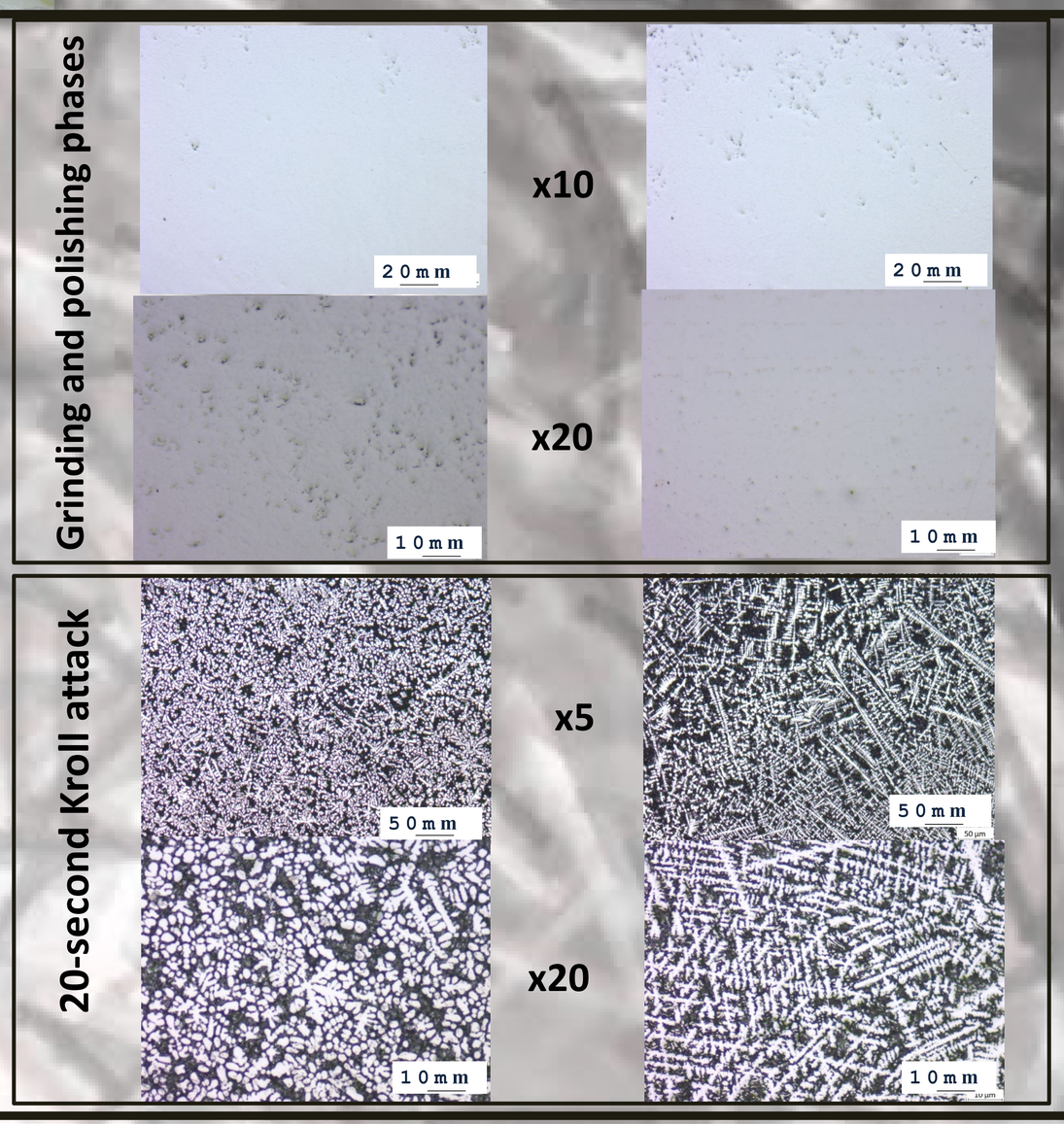
BIOHEA 1

Experience 1



BIOHEA 2

Experience 2