coatings

MDPI

Supplementary Information

Article

Zinc/Silver Particle (Zn/AgP) Composite Coatings: Evaluation of Corrosion in Physiological Environments and Antibacterial Activity Against *P. aeruginosa*

Berenice Castro-Rodríguez [1], Arnulfo Terán-López [1], Yolanda Reyes-Vidal [1], Francisco J. Bácame-Valenzuela [1], José G. Flores [1], Raúl Ortega [1], José Mojica [1], Erika Acosta [2], Jorge Vázquez-Arenas [3], René H. Lara [4] and Gabriel Trejo [1,*]

[1] Centro de Investigación y Desarrollo Tecnológico en Electroquímica (CIDETEQ), Parque Tecnológico Sanfandila, Querétaro C.P. 76703, Mexico; bcastro@cideteq.mx (B.C.-R.); ateran@cideteq.mx (A.T.-L.); mreyes@cideteq.mx (Y.R.-V.); fbacame@cideteq.mx (F.J.B.-V.); jflores@cideteq.mx (J.G.F.); rortega@cideteq.mx (R.O.); jmojica@cideteq.mx (J.M.)

[2] Facultad de Medicina, Centro de Investigación en Salud Aplicada (CIASaP), Universidad Autónoma de Sinaloa, Sinaloa C.P. 80246, Mexico; erika.acosta@uas.edu.mx

[3] Centro Mexicano para la Producción más Limpia, Instituto Politécnico Nacional, Mexico City 07340, Mexico; jorge_gva@hotmail.com

[4] Laboratorio de Electroquímica y Análisis de Superficies, Facultad de Ciencias Químicas, Departamento de Ciencia de Materiales, Universidad Juárez del Estado de Durango (UJED) Circuito Universitario, Durango 34120, Mexico; Icrh75@hotmail.com

***** Correspondence: gtrejo@cideteq.mx

Received: 21 February 2020; Accepted: 23 March 2020; Published: 1 April 2020

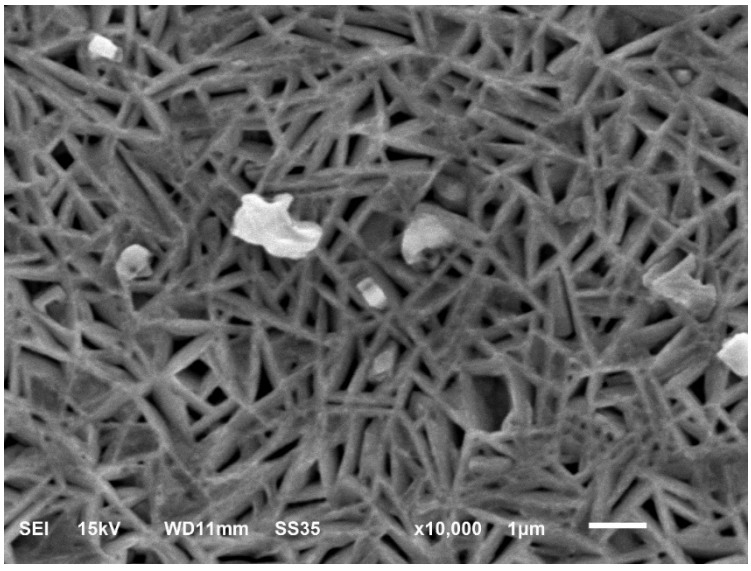
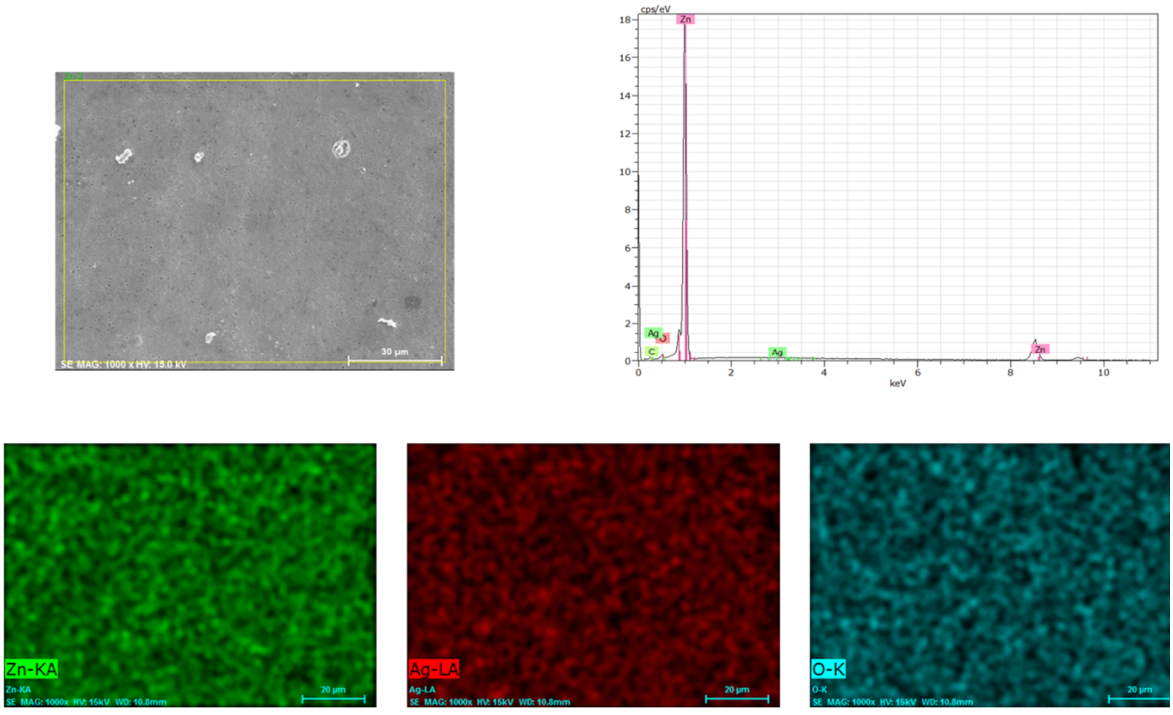
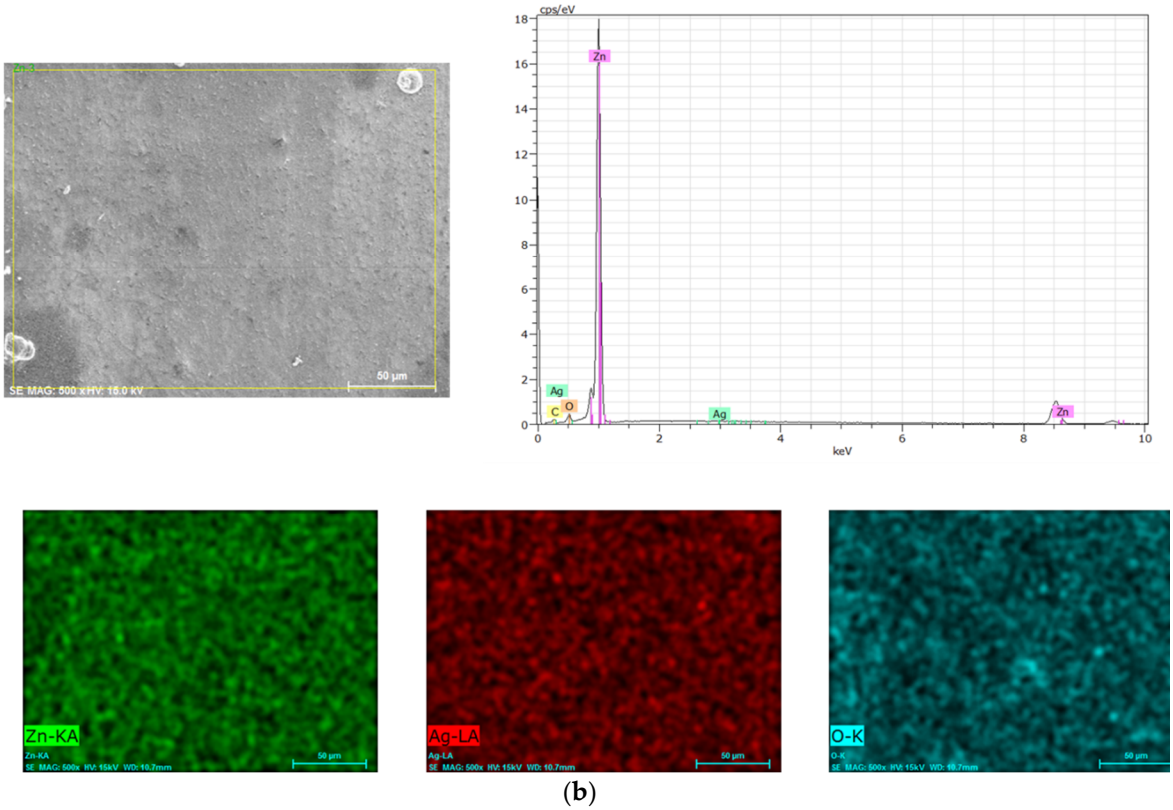


Figure S1. SEM images of Zn/AgP composite coatings obtained from S_0 solution (= 81 g·L^{-1} $ZnCl_2$ + 25 g·L^{-1} H_3BO_3 + 208.8 g·L^{-1} KCl + 1.5 g·L^{-1} PEG 8000 + 0.2 g·L^{-1} BDA + 0.03 g·L^{-1} cetyl trimethylammonium hydrogen sulphate (CTHS) + 2.8 g·L^{-1} triethanolamine) + 3.5 g·L^{-1} AgNPs.


SE MAG: 1000 x HV: 15.0 kV
30 µm
cps/eV
Zn
Ag
C
Ag
Zn
keV
Zn-KA
Ag-LA
O-K
20 µm

(**a**)


SE MAG: 500 x HV: 15.0 kV
50 µm
cps/eV
Zn
Ag
C
O
Ag
Zn
keV
Zn-KA
Ag-LA
O-K
50 µm

(**b**)

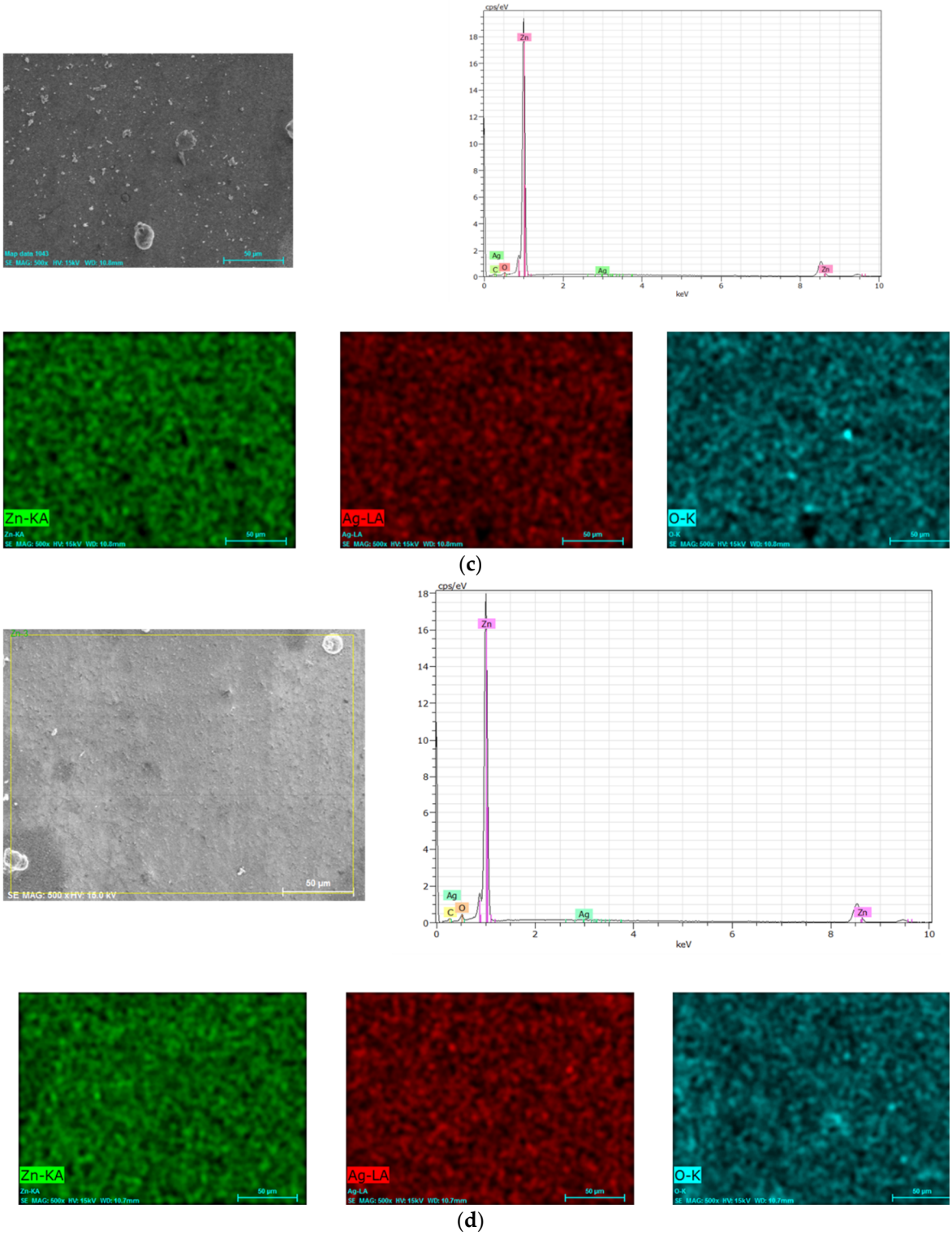


Figure S2. Elemental mapping analyses of the Zn/AgP coatings obtained from. (**a**) S_0 solution + 0.5 g·L^{-1} AgPs (**b**) S_0 solution + 1.5 g·L^{-1} AgPs. (**c**) S_0 solution + 3.5 g·L^{-1} AgPs. (**d**) S_0 solution + 4.5 g·L^{-1} AgPs.

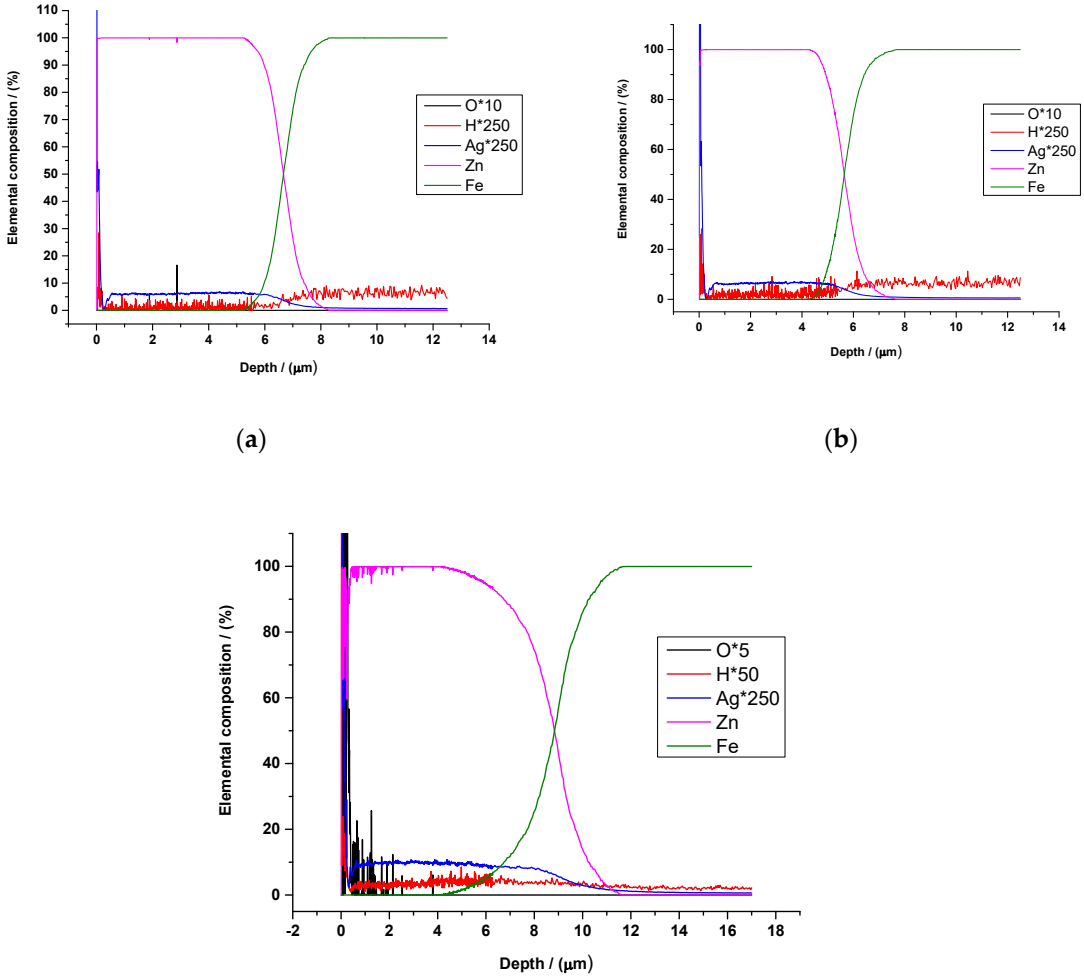
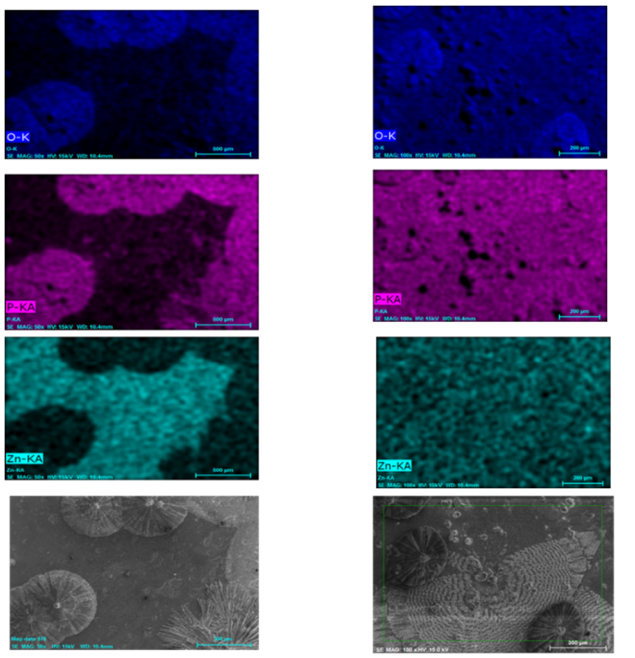
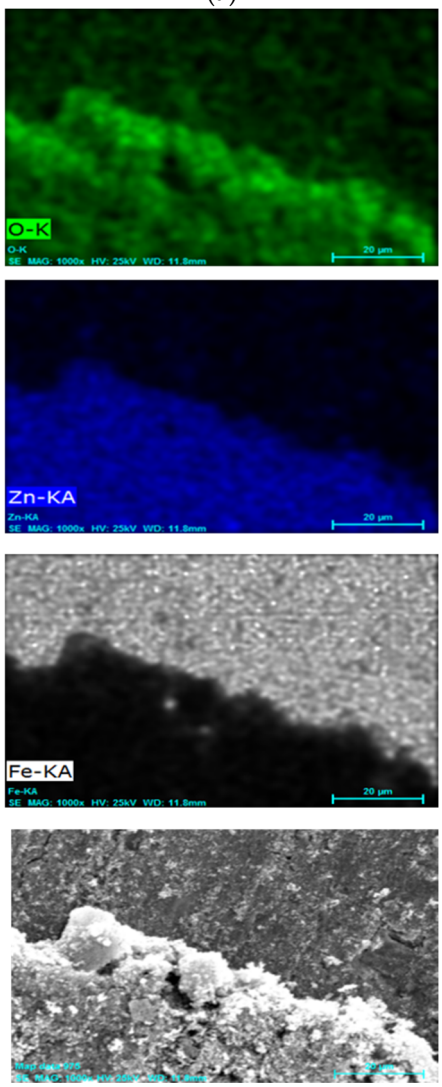


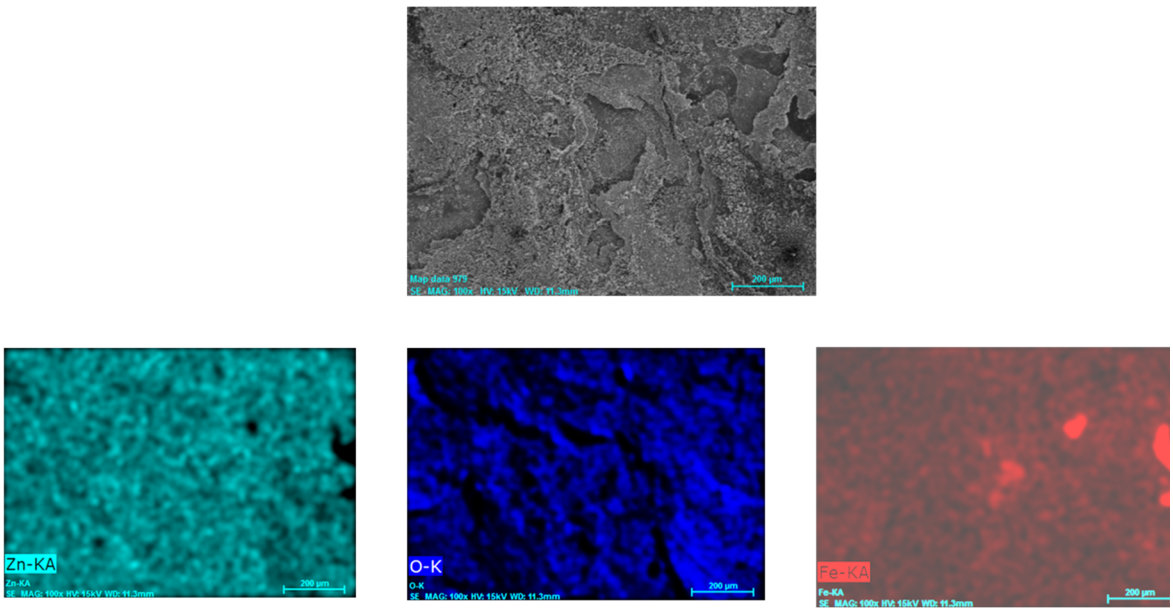
Figure S3. GD-OES profiles obtained from Zn/AgP composite coatings formed from. S_0 solution with: (**a**) 1.0 g·L^{-1}AgPs, (**b**) 2.5 g·L^{-1} AgPs and (**c**) 3.5 g·L^{-1}AgPs by applying 8.5 mA cm^{-2} for 60 min a 25 °C.



(**a**)

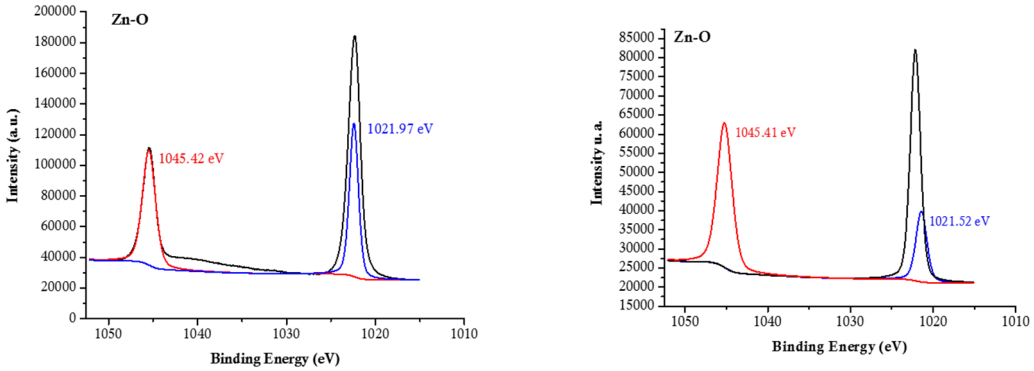


(**b**)



(**c**)

Figure S4. (**a**) Elemental mapping analyses of the Zn and Zn/AgP (0.30 wt. % Ag) coatings obtained after 7 days of immersion in PBS´s solutions at 37 °C. (**b**) Elemental mapping analyses of the Zn coatings obtained after 7 days of immersion in Hank´s solutions at 37 °C. (**c**) Elemental mapping analyses of the Zn/AgP (0.30 wt. % Ag) coatings obtained after 7 days of immersion in Ringer´s solutions at 37 °C.



(**a**) (**b**)

Figure S5. XPS analyses of the Zn and Zn/AgP (0.30 wt.% Ag) coatings obtained after 7 days of immersion in Hank´s solutions at 37 °C.