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Supplementary information

Cathodic electrodeposition of zinc-zinc phosphate-calcium phosphate composite coatings on pure iron for biodegradable implant applications

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Table S1: Assignment of FT-IR and Raman bands of zinc - zinc phosphate - calcium phosphate composite coatings deposited on pure iron by CED under varying current densities at 27 °C for 30 min

FT-IR bands (cm^{-1})	Assignment	Raman bands (cm^{-1})	Assignment
3521	(O-H) stretching of H_2O	302	M-O bending mode
3189	(O-H) stretching of H_2O	442	ν_2 bending mode of HPO_4^{2-} and PO_4^{3-}
1635	H-O-H bending of H_2O	572	ν_4 bending mode of HPO_4^{2-} and PO_4^{3-}
1100	ν_3 P-O asymmetric stretching of HPO_4^{2-} and PO_4^{3-}	808	P-O(H) stretching of HPO_4^{2-}
1069	ν_3 P-O asymmetric stretching of HPO_4^{2-} and PO_4^{3-}	986	ν_1 P-O symmetric stretching of PO_4^{3-}
1009	ν_3 P-O asymmetric stretching of HPO_4^{2-} and PO_4^{3-}	1070	ν_3 P-O asymmetric stretching of HPO_4^{2-} and PO_4^{3-}
929	ν_1 P-O symmetric stretching of HPO_4^{2-}	1136	ν_3 P-O asymmetric stretching of HPO_4^{2-} and PO_4^{3-}
627	ν_L liberation of the OH^- group of H_2O	1220	P-O-H in plane bending of HPO_4^{2-}
570	O-P-O(H) bending	1380	P-O-H in plane bending of HPO_4^{2-}
		1626	H-O-H bending of H_2O
		1756	H-O-H bending of H_2O

Table S2: Assignment of FT-IR and Raman bands of zinc -zinc phosphate - calcium phosphate composite coatings deposited on pure iron by CED at 2 mA/cm^2 at 27 °C for 30 min, after immersion in HBSS at 37 ± 1 °C for 168 h

IR bands (cm^{-1})	Assignment	Raman bands (cm^{-1})	Assignment
3346	(O-H) stretching of H_2O	310	M-O bending mode
2921	(P)O-H stretching	597	ν_4 bending mode of HPO_4^{2-} and PO_4^{3-}
2850	H-O-H bending and rotation of H_2O	943	ν_1 P-O symmetric stretching of PO_4^{3-}
1747	H-O-H bending of H_2O	997	ν_3 P-O asymmetric stretching of HPO_4^{2-} and PO_4^{3-}
1624	H-O-H bending of H_2O	1057	ν_3 P-O asymmetric stretching of HPO_4^{2-} and PO_4^{3-}
1445	ν_3 Asymmetric stretching of CO_3^{2-}	1154	ν_3 P-O asymmetric stretching of HPO_4^{2-} and PO_4^{3-}
1382	P-O-H in-plane bending		
1192	P-O-H in-plane bending		
1103	ν_3 P-O asymmetric stretching of HPO_4^{2-} and PO_4^{3-}		
1024	ν_3 P-O asymmetric stretching of HPO_4^{2-} and PO_4^{3-}		
946	ν_1 P-O symmetric stretching of HPO_4^{2-}		

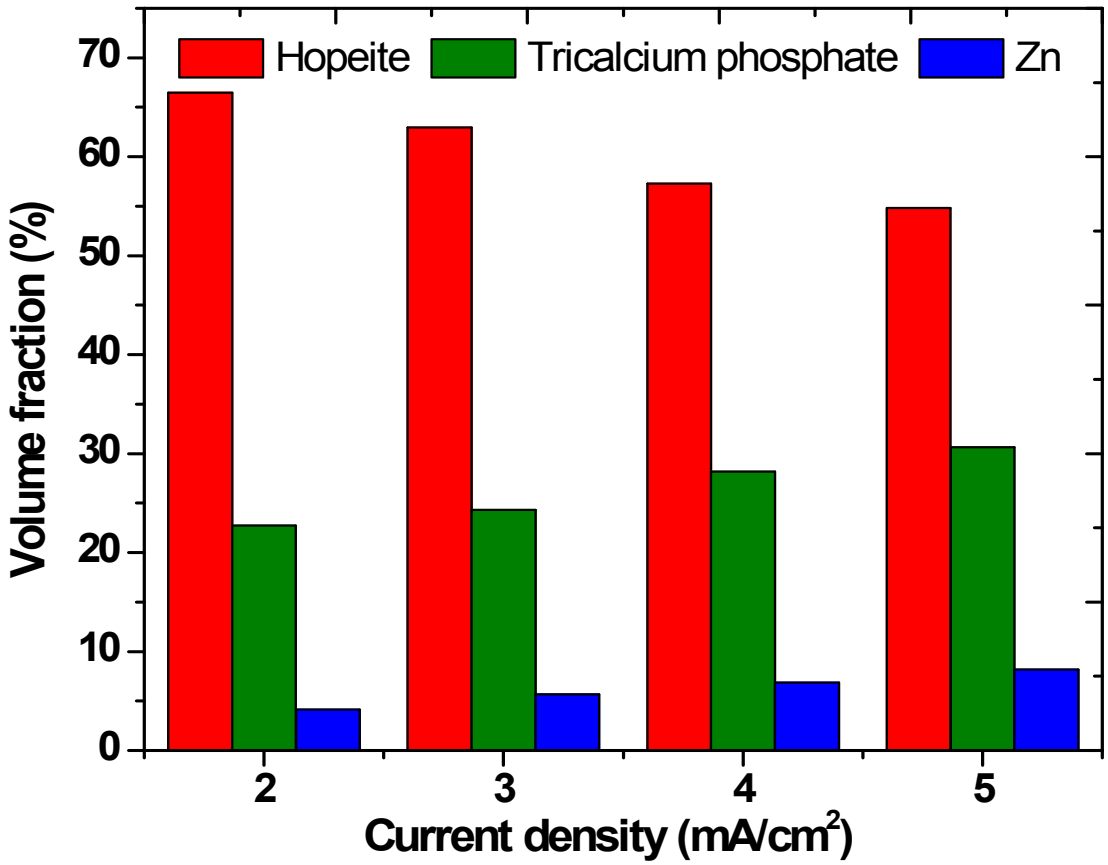

Fig. S1 Volume fraction of zinc phosphate (hopeite), calcium phosphate and zinc in the composite coatings formed on pure iron by cathodic electrodeposition under varying current densities (2 to 5 mA/cm^2) at 27 °C for 30 min, estimated from the XRD patterns