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Title: Comparative study on effects of different coatings on biodegradable and wear properties of Mg-2Zn-1Gd-0.5Zr alloy

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Abstract: Coating is one of the effective methods to improve the corrosion resistance of the biodegradable Mg alloys. In this work, comparative study on the effects of micro-arc oxidation (MAO) coating, Sr-P coating and Ca-P coating on the biodegradable and wear properties of Mg-2Zn-1Gd-0.5Zr alloy were investigated. The results showed that the degradation deposition contained Gd on the surfaces of both MAO coating and Sr-P coating, which stabilized the coating, thereby increasing the degradation resistance of the alloy. The wear test showed that MAO coating and Ca-P coating exhibited good wear resistance. For a 5N loading, the sliding distances of MAO coating, Sr-P coating and Ca-P coating were 2.24m, 0.29m and 9.00m respectively, before the coatings were completely destroyed. This investigation revealed that the MAO coating exhibits the best degradation resistance and the Ca-P coating exhibits the best wear resistance.

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