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ABSTRACT

Heretofore, understandings about the effects of scandium on properties of magnesium alloys for biodegradable implant applications are extremely limited. In the present study, four Mg–1.5Zn–0.6Zr–xSc (ZK21–xSc, x=0, 0.2, 0.5, 1.0 wt.%) alloys were fabricated and investigated with respect to the microstructure and mechanical properties. Microstructure characterization indicated that grain sizes were refined and more precipitated particles were observed with increasing Sc addition. Mechanical testing revealed that improved yield strength and decreased elongation were obtained after Sc being added. Compared with other developed Mg alloys, the ZK21–0.2Sc alloy demonstrates balanced combination of strength and elongation, which shows great potential in biodegradable materials application.

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