SN-ZN RIBBONS FOR MEDICAL IMPLANTS

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The development of metal membranes used in reconstruction of buccal-maxilla-facial parts requires the use of biocompatible and functional materials, to avoid the release of toxic ions and to stimulate bone integration. In this context, tin and zinc present low toxicity and possibilities of bodily reabsorption, respectively. Thus, the Sn, Sn-3wt-%Zn and Sn-5wt-%Zn ribbons were produced by melt spinning and were characterized by optical microscopy, scanning electron microscopy coupled with energy dispersive spectrometry (EDS), X-ray diffraction (XRD), differential scanning calorimetry (DSC), thermogravimetric analysis and corrosion tests. The melt spun ribbons presented thicknesses close to 40 μm. The results of optical microscopy and scanning electron microscopy showed that these ribbons presented two distinct surfaces: smooth (in contact with the copper disk) and rough (in contact with the atmosphere). According to the XRD results, single-phase grain structures were found on the rough surface of both tin, Sn-3wt-%Zn and Sn-5wt-%Zn ribbons. Extended solid solutions were formed in these melt spun Sn-Zn ribbons. A lower amount of Zn was detected by EDS in the ribbons due to its preferential evaporation during heating. DSC analyses showed a slight change in the baseline at temperatures of 194°C which is the eutectic temperature of Sn-Zn binary system . Information on the corrosion behavior of the ribbons by the mass loss technique in body fluid solution will be also discussed in this work. The authors thank FAPEMIG, CNPq, CAPES and FAPESP for the support they have received in their research.

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