Biomaterial mampu luruh alami Fe-Mn-C diproduksi melalui metalurgi serbuk ferromangan, besi, dan karbon dengan perlakuan canai dingin dan re-Sinter = Biodegradable material Fe-Mn-C produced by powder metallurgy ferromangan, iron, and carbon with treatment of cold roll and re-Sinter

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Abstrak

Paduan biomaterial baja mangan untuk aplikasi biodegredable stent diproduksi dengan metode metalurgi serbuk diteliti dengan melihat pengaruhnya terhadap post treatment (canai dingin + re-sintering). Pemaduan mekanik metalurgi serbuk dilakukan dengan metode pengadukan sederhana dengan komposisi target (25%Mn dan 35%Mn). Post treatment dengan canai dingin reduksi 50% dan sinter ulang dengan aliran gas Ar pada temperatur 1100oC selama 2 jam. Pengaruh post treatment pada mikrostruktur, sifat mekanik dengan kekerasan Rockwell A, dan sifat korosi dengan celup dan polarisasi telah diteliti dan dibandingkan dengan biomaterial baja mangan sebelum post treatment.
Hasil dari pengujian setelah post treatment, material membentuk fasa austenit, ferrit, dan martensit. Pengaruh post treatment meningkatkan ketahanan korosi dan kekerasan pada baja mangan. Hal ini disebabkan karena persentase porositas berkurang setelah dilakukan post treatment. Laju korosi dilakukan dalam larutan Hank's dan ringer laktat. Pembentukan lapisan pasif Ca/P dan hidroksida terjadi setelah pengujian celup 7 hari dalam larutan Hank's.
.....Manganese alloy steel as biodegredable biomaterials for stent applications produced by powder metallurgy methods were investigated by looking at the effect on post-treatment (cold rolled + re-sintering). Mechanical alloying powder metallurgy done by a simple mixing method with the target composition of Mn (25% and 35%). Post treatment with a cold rolled of 50% reduction and resnintering with Ar gas stream at a temperature of 1100oC for 2 hours. The effect of post treatment on the microstructure, mechanical properties with a Rockwell hardness, and corrosion properties with immersion and polarization have been studied and compared with the biomaterial manganese steel before post treatment.
The results after the post treatment material formed austenite, ferrite and martensite. The effect of post-treatment increase the corrosion resistance and hardness on manganese steel. This occured because the percentage of porosity is decreased after post-treatment. Corrosion rate performed in Hank's solution and ringer's lactate. Hydroxide and Ca/P Passive layer formation occurred after 7 days immersion tests in Hank's solution.