

Fabrication of alloys in the solid state via mechanical alloying (MA) process has been studied by the earlier researchers. The effects of milling time and impact force, defined as the ball-to-powder weight ratio (BPR), on the crystallite size of nanostructured Al-45wt.%Zn alloy via MA process were evaluated in the current work. The mechanical milling was performed in a high-energy ball milling Fritsch P-6 planetary mill at different milling times and BPRs using stainless steel container and balls. X-ray diffraction (XRD) technique and scanning electron microscopy (SEM) were utilized for evaluating the structure, crystallite size and elemental diffusion of the milled powders. Results revealed that increasing the milling time and impact force give rise to decreasing the crystallite size during the MA process. The crystallite size after 10h milling at the BPR of 20:1 was  $\approx 27$ nm. The interpretation of data resulted have been discussed in details.

Keywords: Nanostructure, Al-45wt.%Zn, Mechanical Alloying.

### **DSL103**

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### **Silver and Titanium Nanoparticles used as Coating on Polyurethane Catheters**

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Silver nanoparticles have been used in the medical area due to their remarkable antimicrobial properties [1]. In this sense titanium dioxide nanoparticles obtained by the sol-gel method were used as coating of catheters for subsequent impregnation of silver nanoparticles with gamma irradiation and electron beam at 25 and 50 kGy [2]. This work aimed to study the use of the silver nanoparticles and titanium dioxide as coating of polyurethane Central Venous Catheter (CVC) for antimicrobial activity. Furthermore the amounts of titanium and silver present in the coated catheters had been evaluated by Inductively Coupled Plasma – Optical Emission Spectrometry (ICP OES). Therefore the Raman spectrometry was used to identify the polymorph of titanium oxide, rutile.

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[2] D.P. Macwan, N.D. Pragnesh, S. Chaturvede, J. Materials Science, Vol.46, p.3669, (2011).

### **DSL125**

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### **Study of the Ball Milling Device for Synthesizing Nanocrystalline Powder**

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