**Study of the Mechanism of Cu-Zn Mechanical alloying by X-ray Powder Diffraction**

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A set of Cu-30%Zn,Cu-49%Zn, Cu-65%Zn and Cu-86%Zn (that are in composition range of the phases α, β', γ and ε, respectively) have been synthesized by mechanical alloying of the stoichiometric mixtures of pure copper and zinc powders in a planetary mill of high grinding energy by using a ratio weight of the balls/weight of sample (RBS here after) equal to 3.3.

The results obtained have shown that the full alloying of the starting mixtures of copper and zinc powders is attained after 3 hours of grinding. The study of the intermediate phases as a function of the grinding time pointed out that the reaction is started with the formation of phases very rich in zinc, like the ε phase, and continue reacting with copper until the full alloying is achieved. This behavior suggests that the mechanical alloying takes place trough a mechanism that implies the diffusion of copper into the zinc matrix.

On the other hand, the grinding under more severe conditions (RBS equal to 13.3) extends considerably the composition range at which α phase becomes stabilized. A mechanochemical Cu-Zn binary phase diagram at room temperature is proposed.

**Keywords: Cu-Zn alloys, mechanical alloying, Cu-Zn phase diagram**