

**PROCESSING OF  $\text{LiCo}_{0.9}\text{Mn}_{0.1}\text{O}_2$  MATERIALS TO NANO-SIZE**

**USING A BALL MILLING METHOD**

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## **ABSTRACT**

### **PROCESSING OF $\text{LiCo}_{0.9}\text{Mn}_{0.1}\text{O}_2$ MATERIALS TO NANO-SIZE USING A BALL MILLING METHOD**

Preparing  $\text{LiCo}_{0.9}\text{Mn}_{0.1}\text{O}_2$  materials to be nanostructured by using high energy ball milling method is the objective of this book. By using a high-energy ball of 600rpm with 1.0cm diameter and 0.2mm diameter balls in 24hours with 5 minutes grinding and 5 minutes rest, crystallites of the materials are obtained.

## CHAPTER 1

### 1.0 INTRODUCTION

#### 1.1 Background of Study

Recently, a great deal of development of the science and technology of nanoparticles and nanostructure materials has been made. This study of nanoparticles and nanostructures have become an intense activity for many reasons such as interesting characteristics a properties and applications point of view. The production of nanoparticles (particles of 1 micron or smaller) plays an important role in many areas, such as the development of new materials. As a method for materials synthesis, high energy ball milling of powder particles have been developed as an industrial process to successfully produce new alloys and phase mixtures in the 1970's. This kind of method allows the preparation of alloys and composites, which cannot be synthesized via conventional routes. It is also well used to modify the grain sizes of materials in nanoscale. There are two basic strategies that are used to produce nanoparticles which are "top-down" and "bottoms up". "Top-down" term refers here to the mechanical crushing of source material using a milling process. In the "bottoms-up" stage, structures are built up by chemical processes. Figure 1 is shown to describe this process. The process depends on the chemical composition and the desired features specified for the nanoparticles.