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يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

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بالرسالة صفحات لم ترد بالاصل

Suez Canal University
Faculty of Petroleum and Mining Engineering
Department of Metallurgical and Material Engineering

"MECHANICAL ALLOYING TO PRODUCE SOME Fe- CONTAINING ALLOYS"

A Thesis Submitted
In Partial Fulfillment of the Requirements
For the Degree of MASTER

By
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B.SC. (Metallurgical Engineering)

Under The Supervision of

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To The
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ABSTRACT

Mechanical alloying is a solid – state process for producing nonmaterial either metallic or ceramic powders to form solid solutions, intermetallics and amorphous alloys as well.

Fe_X–Cu_{100-X} solid solutions (where X= 10, 30,50,70 & 90 wt%) and intermetallics FeAl, Al_5Fe_2 and Al_3Fe have been obtained by mechanical alloying.

Structural changes of materials during the milling and heat treatment process have been studied by X-ray diffraction, Differential of thermal analysis, Mössbaur spectroscopy, electrical resistivity and hardness measurements while Morphology of milled powders was followed using both Optical and Scanning electron microscopy. Also, lattice parameter, particle size and root mean square (rms) strain of milled powders as function of milling time were calculated.

Results showed that mechanical alloying process is carried out through fine stages particle flattening, welding predominance, equiaxed particle formation, random welding orientation and study state composite powder. Moreover FeAl and Al_5Fe_2 intermetallics could be synthesized directly by mechanical alloying where as Al_3Fe only formed after heat treatment of milled powders.

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INTRODUCTION