The effect of Nickel, Cobalt and Tin On the evolution Of Microstructural and Mechanical properties Of Al-Zn-Mg-Cu Alloys (7000 series) Via Casting, Powder Metallurgy and Friction Stir Processing Techniques

HAIDER T. NAEEM

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By

HAIDER T. NAEEM
(1140410738)

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DECLARATION OF THESIS

Author's full name : **HAIDER T. NAEEM**

Date of birth : **18/08/1984**

Title : **THE EFFECT OF NICKEL, COBALT AND TIN ON THE EVOLUTION OF MICROSTRUCTURAL AND MECHANICAL PROPERTIES OF AL-ZN-MG-CU ALLOYS (7000 SERIES) VIA CASTING, POWDER METALLURGY AND FRICTION STIR PROCESSING TECHNIQUES**

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LIST OF ABBREVIATIONS

Al_2O_3p	Alumina particulates
AlN	Aluminum Nitride
AMCs	Aluminum and its alloy matrix composites
APM	Aluminum powder metallurgy
B	Boron
BM	Ball milling
BPR	ball-to-powder weight ratio
C.R	Corrosion rate
CDRX	Continuous dynamic recrystallization
CEC	Cyclic extrusion compression
Co	Cobalt
CTE	Coefficient of thermal expansion
D.C	Direct chill casting
DDRX	Discontinuous dynamic recrystallization
DRV	Dynamic recovery
ECAP	Equal channel angular processing
EDS	Energy dispersive spectrometry
El%	Elongation
EM	Elastic modulus
Er	Erbium
F	The momentum or the force exerted by the fluid (the slurry jet)
FCC	Face center cubic
FSP	Friction stir processing

FSW	Friction stir welding
Gd	Germanium
Gd	Gadolinium
GDRX	Geometric dynamic recrystallization
GNDs	Geometrically necessary dislocations
GP zones	Guinier-Preston zones
HAZ	Heat-affected zone
HCl	Hydrochloride acid
Hv	Vickers hardness
Kt	Kiloton (metric)
MA	Mechanical alloying
M_f	The mass flow rate of the slurry jet
MMCs	Metal matrix composites
Ni	Nickel
ODS	Oxide dispersion strengthened
OM	Optical microstructure
PCA	Process control agent
PM	Powder metallurgy
Pr	Praseodymium
PRAMCs	Particle reinforced aluminum matrix composites
RE	Rare earth elements
RRA	The retrogression and reaging temper
RSD	The relative sintered densities
Sc	Scandium metal
SCC	Stress corrosion crack