

A356-3%SiC

SiC

A356 .
SiC

SiC

A356

SiC

A356

SiC

SiC

SiC

HB

°C

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) SiC

HB

SiC

HB

SiC A356 :

...SiC

(MMC)

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/ gr/cm³

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/ gr/cm³

SiC

SiC

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Nagarajan , Dutta

SiC

Al-SiC

SiC

SiC

SiC

SiC

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SEM

A356 (SiC)

()

°C

() A356

°C °C °C

()

(SEM)

A356

HB A356 SiC % HB

HB HB

HB HB

HB HB

SiC ()

SiC ()

HB SiC % SiC %

HB HB °C HB

HB HB

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HB HB

SiC

...SiC

SiC
() SEM
μm

μm
()

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A356

()
°C
()

HB HB

A356

SiC %

[]

HB HB

A356-3%SiC₂₀₀

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A356-3%SiC₁₀₀₀

SEM ()

Al-Si

SiC

[] Ashby

[] Arsenault

)

(

...SiC

[7] N.E.Bekheet, "The Effects of aging on the hardness and fatigue behavior of 2024 Al alloy/SiC Composites", Materials & Design, 2002.

A356

	Ti	Zn	Mg	Mn	Cu	Fe	Si	
Al	/	/	/ /	/	/	/	/ /	A356

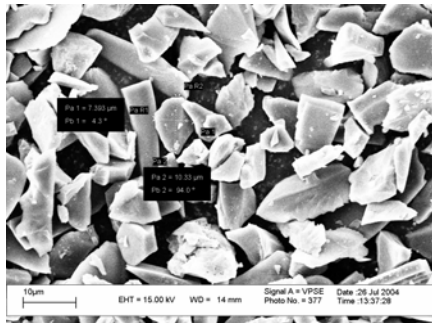
A356

(h)	(°C)		(h)	(°C)		A356

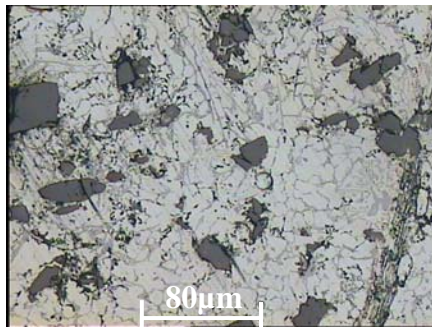
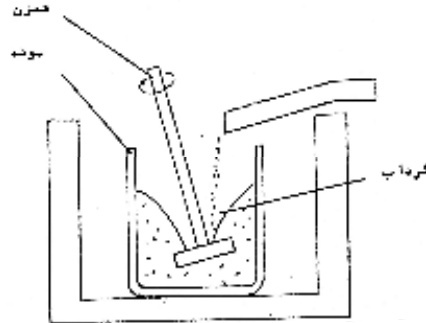
A356

SiC

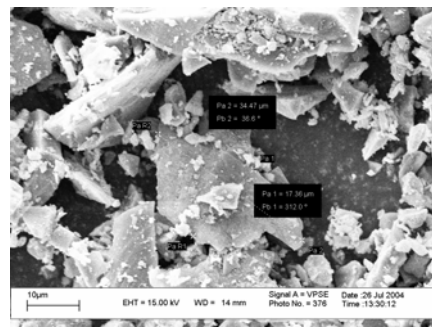
(HB)	(HB)	(HB)	(h)	(°C)	(h)	(°C)	
					/		A356
							A356-3%SiC ₁₀₀₀
							A356-3%SiC ₂₀₀



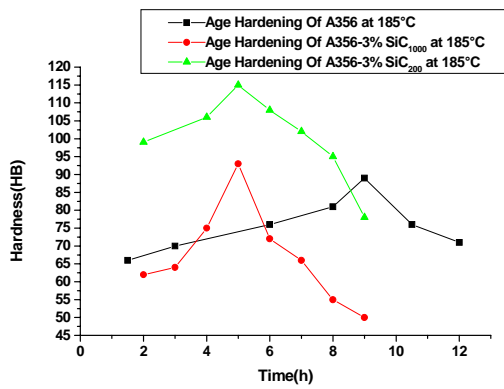
() SiC SEM



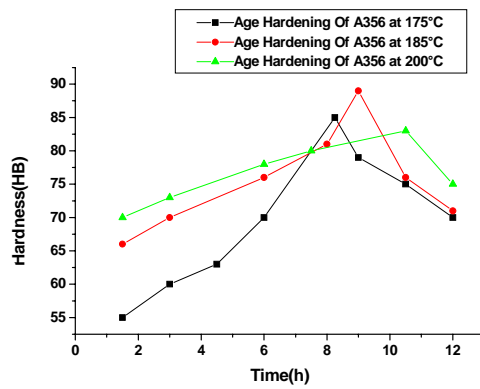
SiC
A356-3%SiC₂₀₀



() SiC SEM

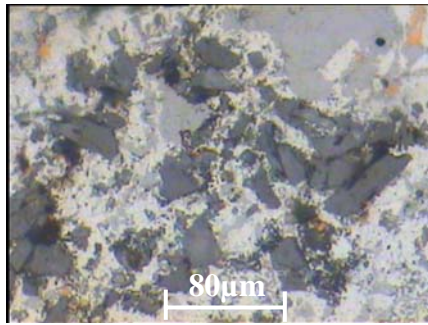


A356-3%SiC₁₀₀₀ A356-3%SiC₂₀₀
°C A356



°C °C °C A356

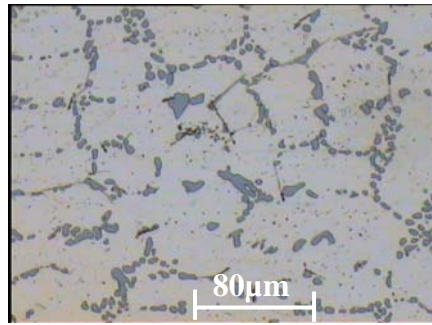
...SiC



A356-3%SiC₁₀₀₀

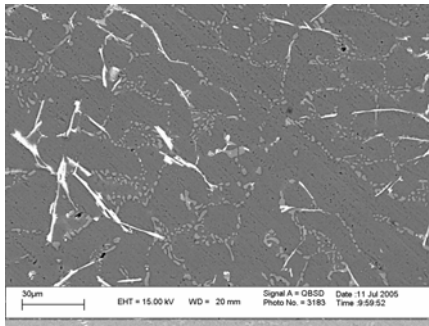
°C

°C



A356

°C



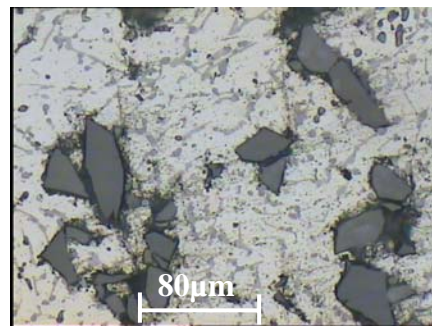
A356

SEM

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°C

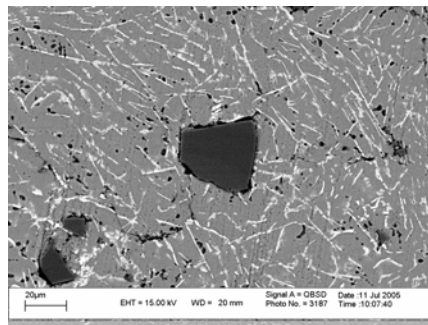
°C



A356-3%SiC₂₀₀

°C

°C



A356-3%SiC₂₀₀

SEM

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°C

°C

Effect Of SiC On Precipitation Hardening Behavior Of A356/SiC_p Composites

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Abstract

Nowadays, MMCs are widely used in different industries. Al alloys are the appropriate base metals for such applications, because of their low density, environmental resistant and good mechanical properties. In this research, fabrication and properties of A356/SiC_p reinforced composite have been studied. A356 is an age hardenable casting alloy. Addition of SiC particles to this alloy improves its mechanical properties. Hence, in this work, the effect of SiC addition on precipitation hardening process was studied. It was found that the addition of SiC particles increased the maximum hardness, as well as the kinetics of precipitation process. Performing the age hardening in 185°C changed the maximum hardness from 88HB in SiC free sample to 93HB in 3% SiC contained sample. At the same time, the time interval during which the maximum hardness was obtained decreased from 9 hours to 5 hours in the presence of 3% volume fraction of SiC. By increasing the particle size of SiC from 1000 to 200 mesh, the maximum hardness value increased to 115HB. While, the time interval to achieve it didn't change.

Keywords: SiC-A356-Age hardening-kinetics

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