

Fe/TiC

TiC

## The Effect of Chemical Composition on Microstructure of FERROTIC Composites

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### Abstract

The effect of titanium content from 3 to 10 Wt.% on the microstructure of Fe/TiC metal matrix composites was studied. The in-situ melting of Fe – 4 Wt.% C and Fe – 72 Wt.% Ti caused reaction between carbon and titanium which produced titanium carbide particles within the melt. The amount of TiC particles and the type of phases present in the matrix were related to primary chemical composition of the melt. Type and amount of matrix phases, shape, size, and distribution of the secondary phase were identified by an optical microscope equipped with micro hardness tester, image analyzer, and X-ray diffractometer. It was found that an increase in titanium content increases the amount of titanium carbide particles and pearlite and decreases eutectical cementite in the matrix.

**Key words:** Metal matrix composites, Ferrotic, Titanium carbide, Microstructure.

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[ ] Fe-C-X

TiC [ ]

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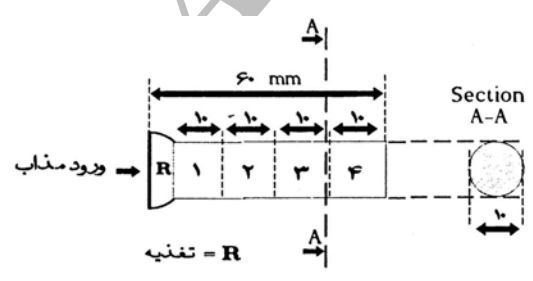
[ ] Fe-Ti-C

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	C	Si	Mn	Ti	V	Al	Fe
(%)	/	/	--	--	--	--	
(%)	--	--	--		/	/	



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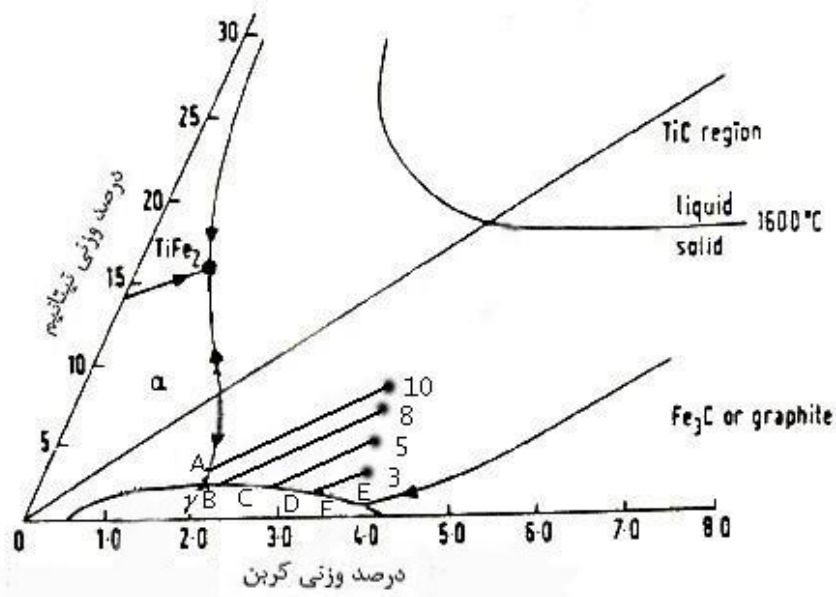
- Leitz Metallux3  
Leitz ASM

Fe-Ti-C

68K

( ) Fe-Ti-C

Philips PW 3710 (XRD)



Fe-Ti-C

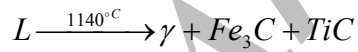
( °C)  
E

E B  
TiC

( )

:

TiC



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A-10

10

A-10

A

(Ti,Fe)C

TiC

TiC (α)

TiC

B

B

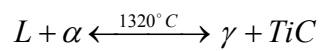
( °C)

TiC F

(γ)

E F

( )



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Terry Wood

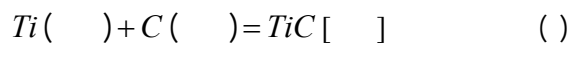
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TiC

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TiC



( ) ( , )

( , ) TiC

TiC

TiC

TiC

TiC

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(Fe<sub>3</sub>C) C Ti  
Ti C  
γ TiC (Fe<sub>3</sub>C)

TiFe TiFe<sub>2</sub>

TiFe<sub>2</sub>

Fe<sub>3</sub>C TiFe

Fe-TiC

TiFe TiFe<sub>2</sub>

Fe<sub>3</sub>C

( ) Fe<sub>3</sub>C

( )

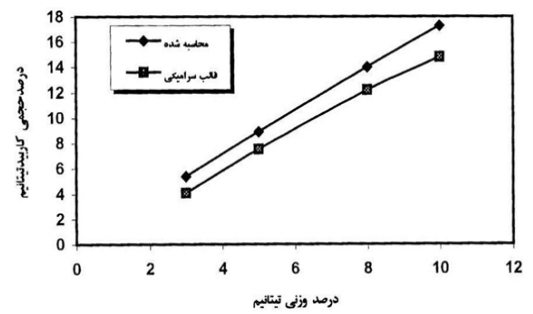
Ti

TiC

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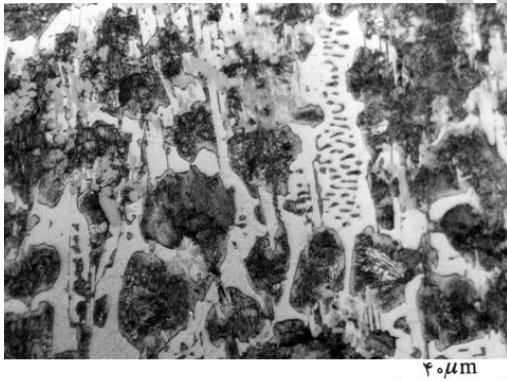
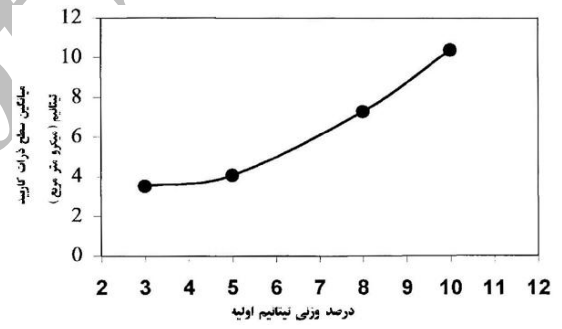
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1- Pre - Eutectic

		TiC				
	TiC		TiC			
% Ti - % / C	/	/	/	/	/	/
% Ti - % / C		/	/	/	/	/
% Ti - % / C	/	/	/	/	/	/
% Ti - % / C	/	/	/	/	/	/

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Ti - % / C

Fe - %

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( : )

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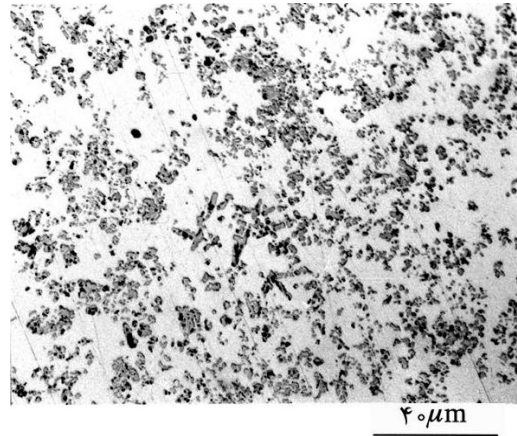
Fe - % Ti - % / C

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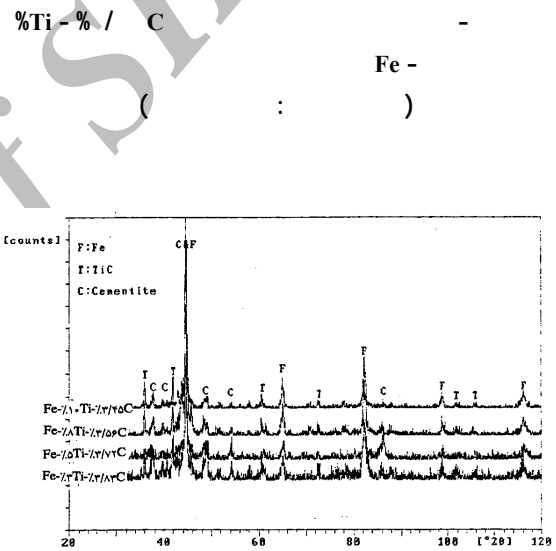
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TiC

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