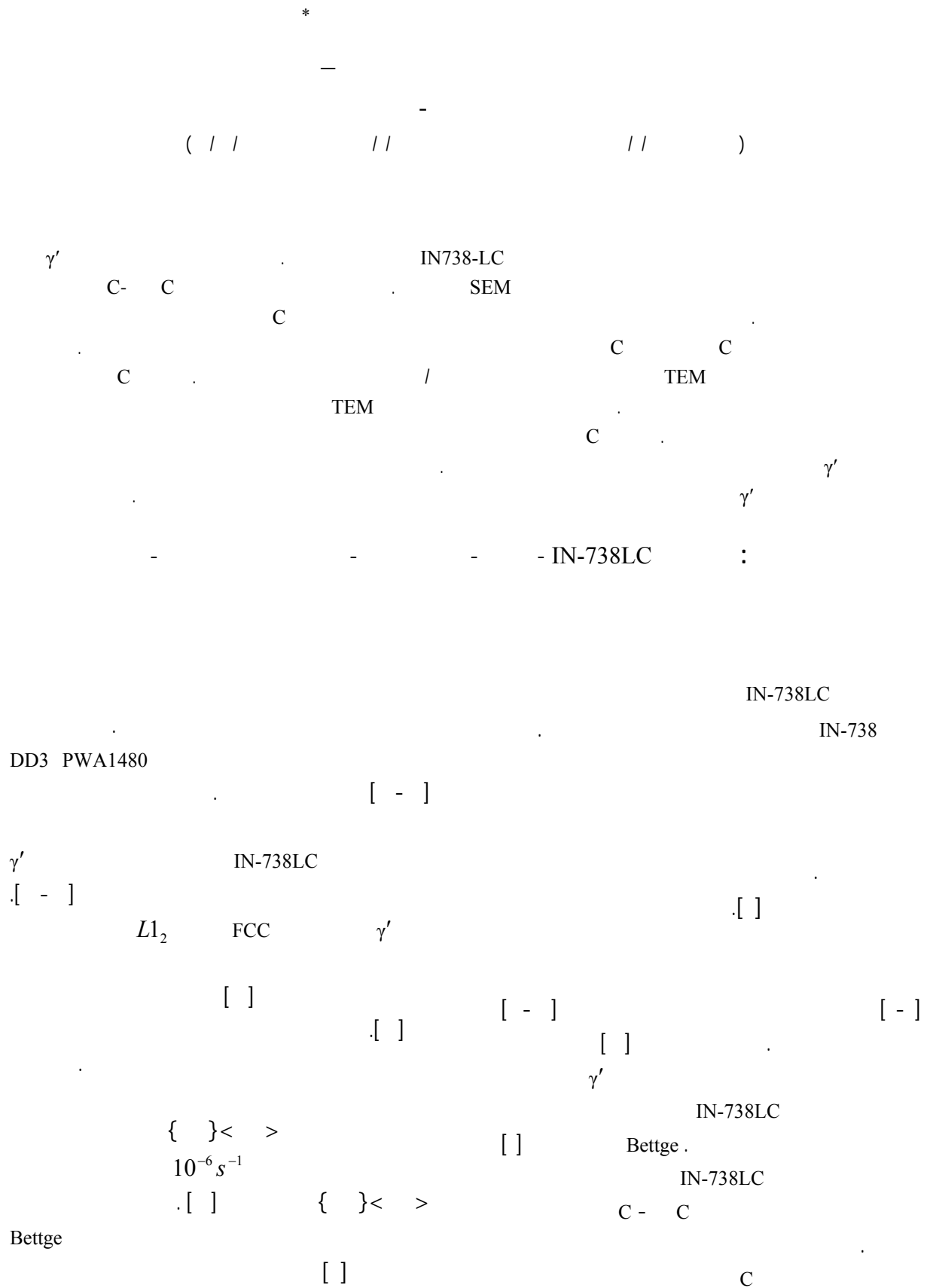


# IN-738LC



---

	( )	[ ]	
	C		{ }
	C		
		/	
			( ) C
$5 \times 10^{-5} s^{-1}$	AG-C	Shimadzu	
cm	(SEM)		$\gamma/\gamma'$
Philips	(TEM)		
TEM		CM200	
			$\gamma'$
TEM			Bettege
Struers	Electrochemical Polishing		
	double jet polisher		:
	- C		(Orowan Loops)
		( )	IN-738LC
		$\gamma'$	
IN-	$\gamma'$		IN-738LC
(Bi-modal Distribution)		738LC	
	$\gamma'$		
( $\gamma'$ )		( $\gamma'$ )	IN-738LC

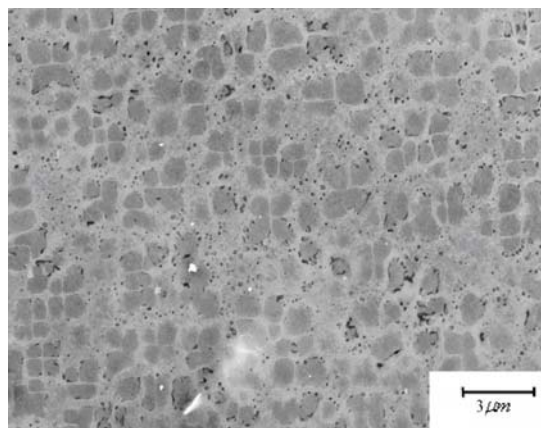
---

TEM ( )  
C

( )

(( ) )  
C

( )

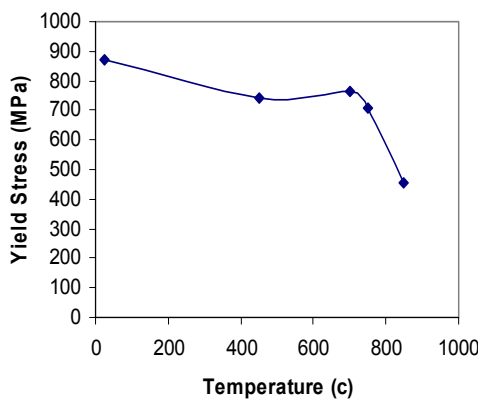


γ' SEM :

(TEM) ( )

IN-738LC

[ ] Shah Dohl

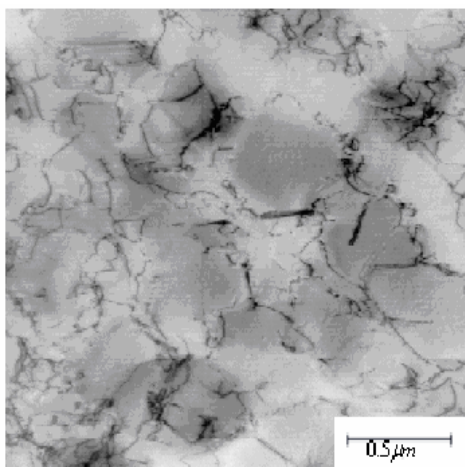


( )

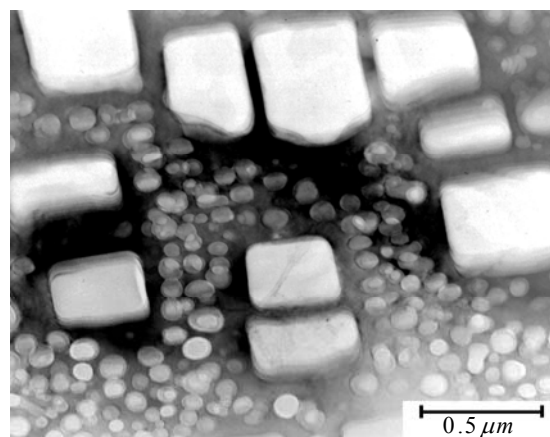
IN-738LC

C C

[ ]



TEM :



IN-738LC TEM :

C

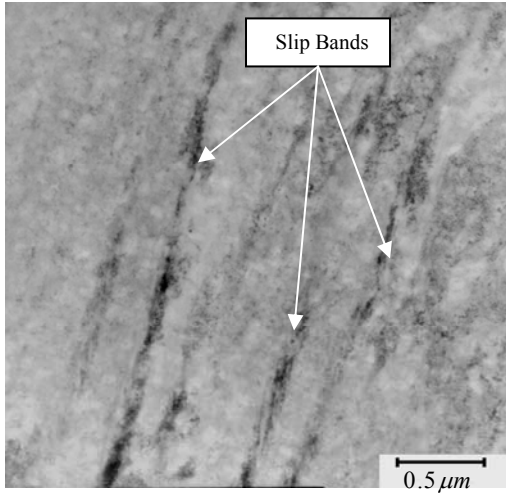
( )

C C

$\gamma'$

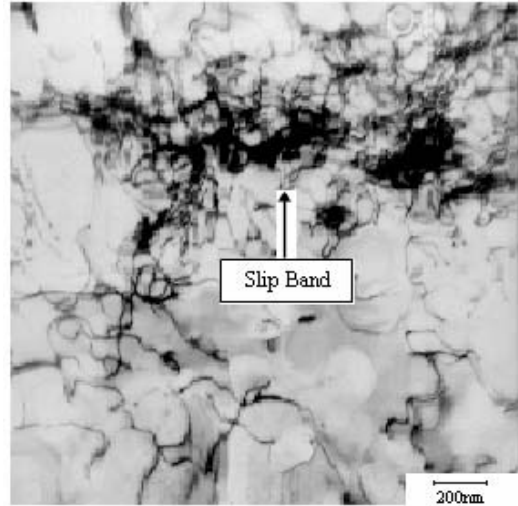
$\gamma'$

$\gamma'$



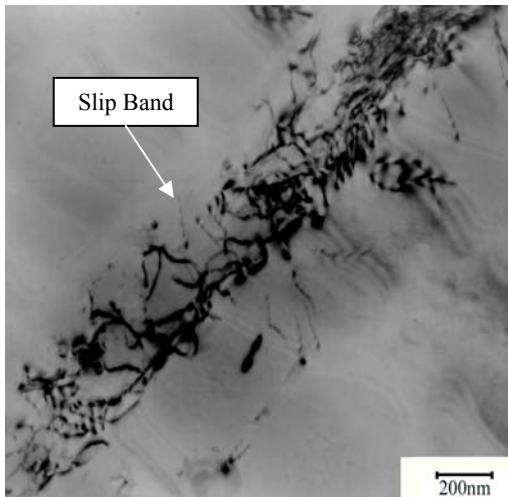
C

:



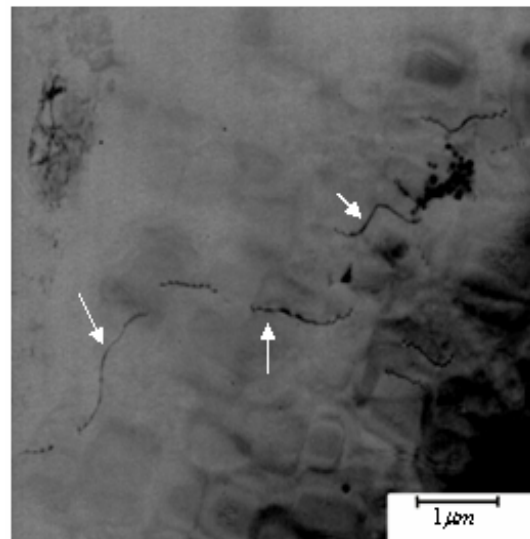
C

:



C

:



C

:

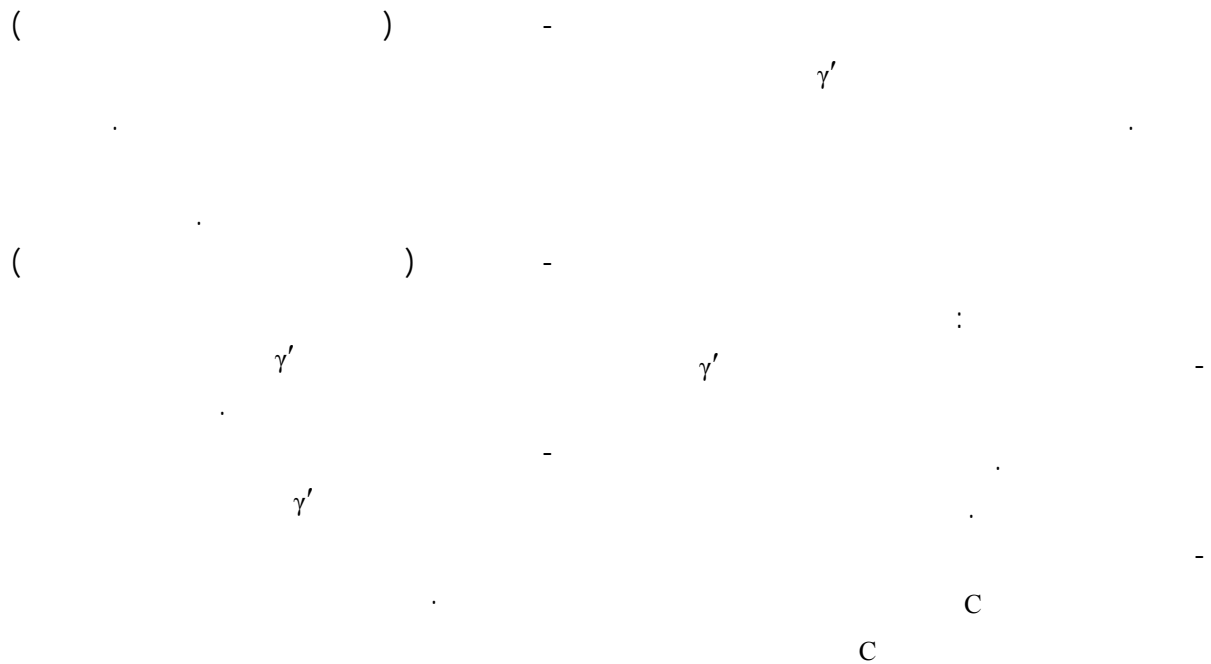
[ ]

{ } < >  $\gamma'$

( )

C

{ } < >



- 1 - Alloy IN-738 technical data, Inco the international nickel company, INC, (1979).
- 2 - Balikci, E., Raman, A. and Mirshams, R. A. (1997). "Influence of various heat treatments on the microstructure of polycrystalline IN-738LC." *Met. Mat. Trans. A*, Vol. 28A, PP.1993-2003.
- 3 - Balikci, E. and Raman, A. (2000). "Characteristics of the precipitates at high temperatures in Ni-base polycrystalline IN738LC." *J. of Materials Science*, Vol. 35, PP.3593-3597.
- 4 - Sharghi-Moshatghin, R. and Asgari, S. (2004). "The effect of thermal exposure on the  $\gamma$  characteristics in a Ni-base superalloy." *J. of alloys and compounds*, Vol. 368, PP.144-151.
- 5 - Sharghi-Moshatghin, R. and Asgari, S. (2003). "Growth kinetics of  $\gamma'$  precipitates in superalloy IN-738LC during long term aging." *Materials and Design*, Vol. 24, PP.325-330.
- 6 - Stevens, R. A. and Flewitt, P. E. (1979). "The effect of  $\gamma'$  precipitate coarsening during isothermal aging and creep of nickel-base superalloy IN-738." *Mat. Science and Eng.*, Vol. 37, PP.237-247.
- 7 - Steven, R. A. and Flewitt, P. E. J. (1978). "Microstructural changes which occur during isochronal heat treatment of the nickel-base super alloy IN-738." *J. of Materials Science*, Vol. 13, PP.367-376.
- 8 - Bettge, D., Osterle, W. and Ziebs, J. (1995). "Temperature dependence of yield strength and elongation of the nickel-base superalloy IN738LC and the corresponding microstructural evolution." *Z.Metallkde*, Vol. 86, PP.190-197.
- 9 - Balikci, E., Mirshams, R. A. and Raman, A. (1999). "Fracture behavior of superalloy IN738LC with various precipitate microstructures." *Materials Science and Engineering A*, Vol. 265, PP.50-62.
- 10 - Sharghi-Moshtaghin, R. and Asgari, S. (2004). "The influence of thermal exposure on the precipitates characteristics and tensile behavior of superalloy IN-738LC." *J. of Materials Processing Technology*, Vol. 147, PP.343-350.

- 
- 11 - Dollar, M. and Bernstein, I. M. (1988). "The effect of temperature on the deformation structure of single crystal nickel base superalloys." *Superalloys 1988*, Edited by S. Richman, The Metallurgical Society, Warrendale, Pennsylvania, U.S.A, PP.275-284.
- 12 - Luo, Z. P., Wu, Z. T. and Miller, D. J. (2003). "The dislocation microstructure of a nickel-base single-crystal superalloy after tensile fracture." *Materials Science and Engineering*, Vol. 354, PP.358-368.
- 13 - Luo, Z. P., Wu, Z. T., Yali Tang, Kramer, M. J. and McCallum, R. W. (1999). "The dislocation structure of a single crystal two phase alloy after tensile deformation." *Materials Characterization*, Vol. 43, PP.293-301.
- 14 - Pope, D. P. and Ezz, S. S. (1984). "Mechanical properties of Nickel base alloys." *Int. Met. Rev.*, Vol. 29, PP.136-166.
- 15 - Stoloff, N. S. (1989). "Physical and mechanical metallurgy of  $Ni_3Al$  and its alloys." *Int. Mat. Rev.*, Vol. 34 No.4 153-183.
- 16 - Thornton, P. H., Davies, R. G. and Johnson, T. L. (1970). "Temperature dependence of yielding behavior in  $Ni_3Al$ ." *Met. Trans.*, 1A, PP.207-214.
- 17 - Paidar, V., Pope, D. P. and Vitek, V. (1984). "A theory of the anomalous yield behavior in  $Al_2$  ordered alloys." *Acta Metall.*, Vol. 32, No. 3, PP.435-448.
- 18 - Sims, C. T. (1987). *Superalloy II*.
- 19 - *Alloy IN-738 Technical Data*, Inco the International Nickel Company, INC, (1979).
- 20- Shah, D. M. and Duhl, D. N. (1981). "The effect of orientation, temperature and gamma prime size on the yield strength of a single nickel base superalloy." *J.Met.*, Vol. 33, PP.24-3.
-