

—

...” , * ” ,
... , * ,
... ,

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* « . »

,

,

(= 250...350). ,
0,10...0,18% , [1-3].

— , — , :

,

,

— ,

, [1, 2].

« » [4].

5], [2,
(. 1), [3, 6] [7]
[8]

.

,

().

,

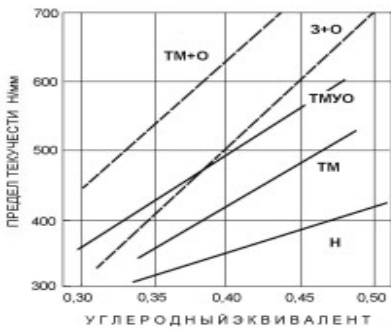
,

[1].

,

—

(. 2,
).
 1150...1200° →
 4...6 → (5...8)
 →
 10...12 →
 →
 →
 Г₁,



1.
 [2]: - - -
 ; - ; - ;
 - ;
 - ;

[1],

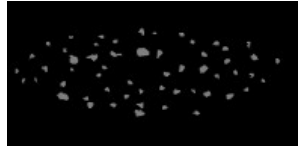
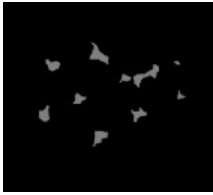
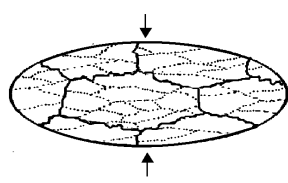
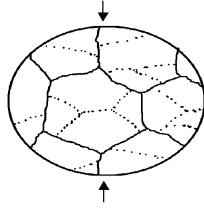
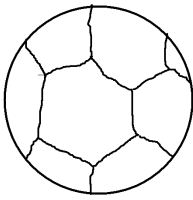
[1, 2].

(. . 1).

30

[1, 2, 6].

, ,
 ,
 (. 3 -), α -
 . $\gamma \rightarrow \alpha$
 . 150...200°
 ,
 [10, 11],
 30...50°
 :
 10...20° r_3
 , [9],
 - ,
 , -
 , . 3 - .
 [10],
 () 5 0,5
 0 3 .
 (02 18 11),
 950° (. 4 -).
 , :
 - [11].
 , r_3
 , (. . 3 -),
 ,
 36 2 (. 5 -).

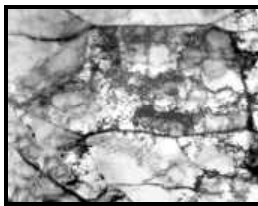
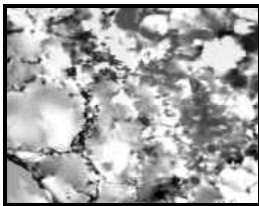


3

: - - ; - - -

α -

r_3 .



4.

90° , $\times 22000$: - = 12%; - = 23%; - = 32%.

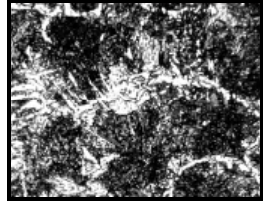
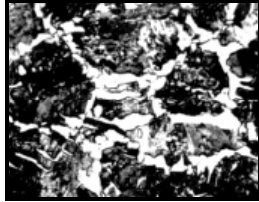
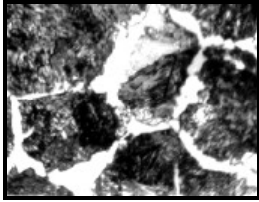
(. 3 , 5)

,
.
,
. 3 ,
,
(. 3 , 5).
(. 3),

(. 3).

5 :

(d 0,5...2,0)



. 5.

1000 ° ; -

1050 ° ; - 36 % 1000 ° .

36 2 ,
, × 800:
16 %

(. . 2).

r_3 (. . 2,),
 α -

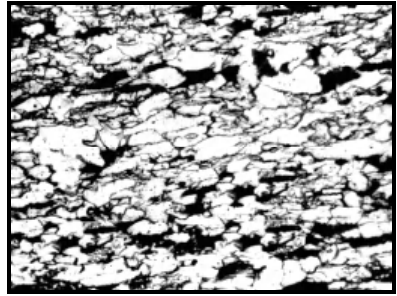
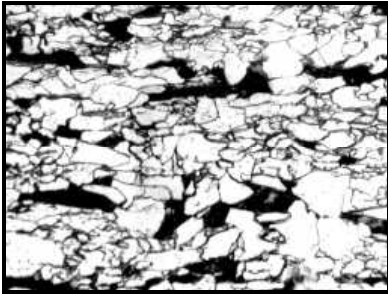
[12-14].

« »

« »

()

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6.

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22

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, ×500.

09 2

1.

2.

3.

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- 4.
 - 1.
 - 2.
 3. Bolshakov V.I. Thermomechanical treatment of construction steels. 3-d edition: Basilian Press. – anada. – 1998. – 316 p.
 4. Yokota T., Garica–Mateo C., Bhadeshia, H. K. D. H., Formation of nanostructured steel by phase transformation. Scripta Materialia. – 2004. – Vol. 51. – P. 767-770.
 - 5.
 6. Sadahiro Yamamoto, Hiroyasu Yokoyama, Katsumi Yamada and Masakazu Niikura. // Effects of the Austenite Grain Size and Deformation in the Unrecrystallized Austenite Region on Bainite Transformation – Behavior and Microstructure. ISIJ Int. – 1995. – Vol. 35. – No. 8. – P. 1020-1026.
 7. Graf M.K., Hillenbrand H.G. and Peters P.A.: d. by Southwick P.D. Accelerated Cooling of Steel. /TMS-AIME, Philadelphia, 1985. – P. 349-366.
 8. Langford G., Cohen M. Subgrains strengthening of materials. // Trans. ASM – 1969. – Vol. 62. – P. 823-835.
 - 9.
 - 10.
 - 11.
 - 10 2 . // . – 2005. – 4 (31). – . 5-11.
 12. Sellars C.M. The physical metallurgy of hot working // Proc. Int. Conf. On Hot Working and Forming Processes. Eds. Sellars C.M. and Davies C.J. The Metal Society of London. – 1980. – . 3-15.
 - 13.
 - 14.
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