

Supplementary materials:

In this section, the selection of the literature data used for the thermodynamic modelling of the Fe–Nb binary system and the Fe–Nb–Zr ternary system are detailed in order to complement the brief description given in our previous paper [1].

The complete quinary database is also provided within this section.

1. The Fe–Nb binary system

1.1 Selection of data

The temperatures and compositions of the invariant reactions, the homogeneity range of the C14 and μ phases, the solubility of the terminal solid solutions as well as the liquidus temperatures between the two eutectic reactions were taken from Voss *et al.* [2]. We also have considered the measurements of the homogeneity range of the C14 and μ phases reported by Bejarano *et al.* [3]. The solubility of the fcc and bcc solid solutions in the Fe-rich side performed by Eggers *et al.* [4], Genders *et al.* [5], Abrahamson *et al.* [6], Bejarano *et al.* [3] and Fischer *et al.* [7] are considered in this study. In addition, we have taken into account the liquidus temperature measurements reported by Voronov [8], Eggers *et al.* [4] and Gibson *et al.* [9] in the Fe-rich side. Finally, the solubility of the bcc solid solution in the Nb-rich side are taken from Bejarano *et al.* [3] and Takeyama *et al.* [10]. Just note that the measurements of the liquidus temperatures in the Nb-rich side performed by Goldschmidt *et al.* [11] are not considered in this study. Indeed, these measurements exhibit important disagreements with the critical assessments available in the literature [12,13]. This set of experimental data seems to be incompatible with other experimental data available in the literature. Concerning the thermodynamic parameters, we have taken into

account the values of the formation enthalpies of the C14 and μ phases calculated by Liu *et al.* [14], Mathon *et al.* [15] and Ladines *et al.* [16] as well as our own DFT calculations and the recent measurement of Syutkin *et al.* [17]. We considered the measurements of the mixing enthalpies of the liquid phase performed by Iguchi *et al.* [18] at 1873 K and Schaeffers *et al.* [93]. We also considered activity measurements reported by Ichise *et al.* [20].

2. The Fe–Nb–Zr ternary system

2.1 Selection of data

All the phase equilibria determined by Liang *et al.* [21] at 973 K and Ramos *et al.* [22,23] at 1073 K and 1173 K and Toffolon *et al.* [24] at 1173 K were considered, except for those involving the C36 phase. Indeed, the C36 phase is found to be unstable according to our experimental investigations as well as our DFT calculations as reported in our previous paper [1]. More generally, the phase equilibria in the Zr-poor region reported by Granovsky *et al.* [25], Tang *et al.* [26] and Liang *et al.* [21] are not compatible with each other and thus are not considered in this study. At last, it should be noted that the recent measurements of Long *et al.* [27] agree well with those of Ramos *et al.* [96] and Granovsky *et al.* [25] for the C14 phase as well as those of Granovsky *et al.* [25] for the Ti₂Ni phase.

References

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TDB :

ELEMENT /-	ELECTRON_GAS	0.0000E+00	0.0000E+00
0.0000E+00!			
ELEMENT VA	VACUUM	0.0000E+00	0.0000E+00
0.0000E+00!			
ELEMENT FE	BCC_A2	5.5847E+01	4.4890E+03
2.7280E+01!			
ELEMENT CR	BCC_A2	5.1996E+01	4.0500E+03
2.3560E+01!			
ELEMENT NB	BCC_A2	9.2906E+01	5.2200E+03
3.6270E+01!			
ELEMENT SN	BCT_A5	9.2906E+01	5.2200E+03
3.6270E+01!			
ELEMENT ZR	HCP_A3	9.1224E+01	5.5663E+03
3.9181E+01!			

FUNCTION GHSECR 298.15 -8856.94+157.48*T-26.908*T*LN(T)+.00189435*T**2
-1.47721E-06*T**3+139250*T**(-1); 2180 Y
-34869.344+344.18*T-50*T*LN(T)-2.88526E+32*T**(-9); 6000 N !

FUNCTION GLIQCR 298.15 +GHSECR#+24339.955-11.420225*T+2.37615E-
21*T**7;
2180 Y
-16459.984+335.616316*T-50*T*LN(T); 6000 N !

FUNCTION GFCCCR 298.15 +GHSECR#+7284+.163*T; 6000 N !

FUNCTION GHCPCR 298.15 +GHSECR#+4438; 6000 N !

FUNCTION GHSEFE 298.15 +1225.7+124.134*T-23.5143*T*LN(T)-
.00439752*T**2
-5.8927E-08*T**3+77359*T**(-1); 1811 Y
-25383.581+299.31255*T-46*T*LN(T)+2.29603E+31*T**(-9); 6000 N !

FUNCTION GFCCFE 298.15 -236.7+132.416*T-24.6643*T*LN(T)-.00375752*T**2
-5.8927E-08*T**3+77359*T**(-1); 1811 Y
-27097.396+300.25256*T-46*T*LN(T)+2.78854E+31*T**(-9); 6000 N !

FUNCTION GLIQFE 298.15 +13265.87+117.57557*T-23.5143*T*LN(T)
-.00439752*T**2-5.8927E-08*T**3+77359*T**(-1)-3.67516E-21*T**7; 1811
Y
-10838.83+291.302*T-46*T*LN(T); 6000 N !

FUNCTION GHCPFE 298.15 -2480.08+136.725*T-24.6643*T*LN(T)
-.00375752*T**2-5.8927E-08*T**3+77359*T**(-1); 1811 Y
-29340.78+304.56206*T-46*T*LN(T)+2.78854E+31*T**(-9); 6000 N !

FUNCTION GHSENB 298.15 -8519.353+142.045475*T-26.4711*T*LN(T)
+2.03475E-04*T**2-3.5012E-07*T**3+93399*T**(-1); 2750 Y
-37669.3+271.720843*T-41.77*T*LN(T)+1.528238E+32*T**(-9); 6000 N !

FUNCTION GLIQNB 298.15 +GHSENB#+29781.555-10.816418*T-3.06098E-
23*T**7;
2750 Y
-7499.398+260.756148*T-41.77*T*LN(T); 6000 N !

FUNCTION GFCCNB 298.15 +GHSENB#+13500+1.7*T; 6000 N !

FUNCTION GHCPNB 298.15 +GHSENB#+10000+2.4*T; 6000 N !

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FUNCTION GHSESRN    100 -7958.517+122.765451*T-25.858*T*LN(T)
+5.1185E-04*T**2-3.192767E-06*T**3+18440*T**(-1); 250 Y
-5855.135+65.443315*T-15.961*T*LN(T)-.0188702*T**2+3.121167E-06*T**3
-61960*T**(-1); 505.08 Y
+2524.724+4.005269*T-8.2590486*T*LN(T)-.016814429*T**2
+2.623131E-06*T**3-1081244*T**(-1)-1.2307E+25*T**(-9); 800 Y
-8256.959+138.99688*T-28.4512*T*LN(T)-1.2307E+25*T**(-9); 3000 N !
FUNCTION GLIQSN    100 +GHSESRN#+7103.092-14.087767*T+1.47031E-18*T**7;
505.08 Y
+9496.31-9.809114*T-8.2590486*T*LN(T)-.016814429*T**2
+2.623131E-06*T**3-1081244*T**(-1); 800 Y
-1285.372+125.182498*T-28.4512*T*LN(T); 3000 N !
FUNCTION GFCCSN    100 +GHSESRN#+5510-8.46*T; 3000 N !
FUNCTION GBCCSN    100 +GHSESRN#+4400-6*T; 3000 N !
FUNCTION GHCPNS    100 +GHSESRN#+3900-7.646*T; 3000 N !

FUNCTION GHSEZR    130 -7827.595+125.64905*T-24.1618*T*LN(T)-
.00437791*T**2
+34971*T**(-1); 2128 Y
-26085.921+262.724183*T-42.144*T*LN(T)-1.342896E+31*T**(-9); 6000 N
!
FUNCTION GLIQZR    298.15 +GHSEZR#+18147.69-9.080812*T+1.6275E-22*T**7;
2128 Y
-8281.26+253.812609*T-42.144*T*LN(T); 6000 N !
FUNCTION GFCCZR    298.15 +GHSEZR#+7600-.9*T; 6000 N !
FUNCTION GBCCZR    298.15 -525.539+124.9457*T-25.607406*T*LN(T)
-3.40084E-04*T**2-9.729E-09*T**3+25233*T**(-1)-7.6143E-11*T**4; 2128
Y
-30705.955+264.284163*T-42.144*T*LN(T)+1.276058E+32*T**(-9); 6000 N
!
FUNCTION UN_ASS    298.15 +0.0; 300 N !

TYPE_DEFINITION % SEQ *!
DEFINE_SYSTEM_DEFAULT ELEMENT 2 !
DEFAULT_COMMAND DEF_SYS_ELEMENT VA /- !

PHASE LIQUID:L % 1 1.0 !
  CONSTITUENT LIQUID:L :CR,FE,NB,SN,ZR : !

PARAMETER G(LIQUID,CR;0)          298.15 +GLIQCR#; 6000 N!
PARAMETER G(LIQUID,FE;0)          298.15 +GLIQFE#; 6000 N!
PARAMETER G(LIQUID,NB;0)          298.15 +GLIQNB#; 6000 N!
PARAMETER G(LIQUID,SN;0)          298.15 +GLIQSN#; 6000 N!
PARAMETER G(LIQUID,ZR;0)          298.15 +GLIQZR#; 6000 N!
PARAMETER G(LIQUID,CR,FE;0)       298.15 -1.35020689E+03
-6.49496588*T; 6000 N!
PARAMETER G(LIQUID,CR,FE;1)       298.15 -4.65239023E+03; 6000 N!
PARAMETER G(LIQUID,CR,NB;0)       298.15 -9.80133887E+03; 6000 N!
PARAMETER G(LIQUID,CR,NB;1)       298.15 +2.64365541E+03; 6000 N!
PARAMETER G(LIQUID,CR,SN;0)       298.15 +102321.4-57.46*T; 6000 N!
PARAMETER G(LIQUID,CR,SN;1)       298.15 +11102; 6000 N!

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PARAMETER G(LIQUID, CR, SN; 2)	298.15	-20421.1; 6000 N!
PARAMETER G(LIQUID, CR, SN; 3)	298.15	-13611.1; 6000 N!
PARAMETER G(LIQUID, CR, ZR; 0)	298.15	-5.3900910E+03-1.5966076*T;
6000 N!		
PARAMETER G(LIQUID, CR, ZR; 1)	298.15	-1.5555731E+03-.74677683*T;
6000 N!		
PARAMETER G(LIQUID, CR, ZR; 2)	298.15	-8.2848000E+03+.92113665*T;
6000 N!		
PARAMETER G(LIQUID, FE, NB; 0)	298.15	-7.48576874E+04
+99.67*T-10*T*LN(T); 6000	N !	
PARAMETER G(LIQUID, FE, NB; 1)	298.15	+17624-10.805*T;
6000 N !		
PARAMETER G(LIQUID, FE, SN; 0)	298.15	+2.1340220E+04; 6000 N !
PARAMETER G(LIQUID, FE, SN; 1)	298.15	-6.3445215E+03; 6000 N !
PARAMETER G(LIQUID, FE, SN; 2)	298.15	-5.5179448E+03; 6000 N !
PARAMETER G(LIQUID, FE, ZR; 0)	298.15	-70236.4553; 6000 N!
PARAMETER G(LIQUID, FE, ZR; 1)	298.15	-3000; 6000 N!
PARAMETER G(LIQUID, NB, SN; 0)	298.15	19380.504; 6000 N !
PARAMETER G(LIQUID, NB, SN; 1)	298.15	13332.524-13.048484*T; 6000
N!		
PARAMETER G(LIQUID, NB, ZR; 0)	298.15	+1.3191882E+04; 6000 N!
PARAMETER G(LIQUID, NB, ZR; 1)	298.15	+1.0054607E+04; 6000 N!
PARAMETER G(LIQUID, SN, ZR; 0)	298.15	-1.04315795E+05
-1.93095423E+01*T; 6000 N!		
PARAMETER G(LIQUID, SN, ZR; 1)	298.15	1.25541031E+04; 6000 N!
PARAMETER G(LIQUID, CR, FE, NB; 0)	298.15	+35000; 6000 N !
PARAMETER G(LIQUID, CR, FE, NB; 1)	298.15	+25000; 6000 N !
PARAMETER G(LIQUID, CR, FE, NB; 2)	298.15	-30000; 6000 N !
PARAMETER G(LIQUID, CR, FE, ZR; 0)	298.15	-80000; 6000 N !

PHASE FCC_A1 % 2 1 1 !

CONSTITUENT FCC_A1 : CR, FE, NB, SN, ZR : VA : !

PARAMETER G(FCC_A1, CR:VA; 0)	298.15	+GFCCCR#; 6000 N!
PARAMETER TC(FCC_A1, CR:VA; 0)	298.15	-1109; 6000 N!
PARAMETER BMAGN(FCC_A1, CR:VA; 0)	298.15	-2.46; 6000 N!
PARAMETER G(FCC_A1, FE:VA; 0)	298.15	+GFCCFE#; 6000 N!
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PARAMETER BMAGN(FCC_A1, FE:VA; 0)	298.15	-2.1; 6000 N!
PARAMETER G(FCC_A1, NB:VA; 0)	298.15	+GFCCNB#; 6000 N!
PARAMETER G(FCC_A1, SN:VA; 0)	298.15	+GFCCSN#; 6000 N!
PARAMETER G(FCC_A1, ZR:VA; 0)	298.15	+GFCCZR#; 6000 N!
PARAMETER G(FCC_A1, CR, FE:VA; 0)	298.15	2.06049365E+04
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PARAMETER G(FCC_A1, CR, FE:VA; 1)	298.15	7.35526709E+02; 6000 N!
PARAMETER G(FCC_A1, CR, NB:VA; 0)	298.15	-1560+10*T; 6000 N!
PARAMETER G(FCC_A1, CR, NB:VA; 1)	298.15	+100710; 6000 N!
PARAMETER G(FCC_A1, CR, SN:VA; 0)	298.15	+147582+8*T; 6000 N!

PARAMETER G(FCC_A1,CR,SN:VA;1)	298.15	+184890; 6000 N!
PARAMETER G(FCC_A1,CR,ZR:VA;0)	298.15	4.7603600E+01; 6000 N!
PARAMETER G(FCC_A1,CR,ZR:VA;1)	298.15	9.6554800E+01; 6000 N!
PARAMETER G(FCC_A1,FE,NB:VA;0)	298.15	-9122.78+0*T; 6000 N!
PARAMETER G(FCC_A1,FE,SN:VA;0)	298.15	+23510; 6000 N !
PARAMETER G(FCC_A1,FE,ZR:VA;0)	298.15	6.0000000E+04; 6000 N!
PARAMETER G(FCC_A1,NB,SN:VA;0)	298.15	6588.133+10.001*T; 6000 N!
PARAMETER G(FCC_A1,NB,SN:VA;1)	298.15	-156019.16; 6000 N!
PARAMETER G(FCC_A1,NB,ZR:VA;0)	298.15	21463; 6000 N!
PARAMETER G(FCC_A1,NB,ZR:VA;1)	298.15	6868; 6000 N!
PARAMETER G(FCC_A1,SN,ZR:VA;0)	298.15	-70201; 6000 N!
PARAMETER G(FCC_A1,SN,ZR:VA;1)	298.15	-87785; 6000 N!
TYPE_DEFINITION & GES A_P_D BCC_A2 MAGNETIC -1.0 4.00000E-01 !		
PHASE BCC_A2 %& 2 1 3 !		
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PARAMETER G(BCC_A2,CR:VA;0)	298.15	+GHSERCR#; 6000 N!
PARAMETER TC(BCC_A2,CR:VA;0)	298.15	-311.5; 6000 N!
PARAMETER BMAGN(BCC_A2,CR:VA;0)	298.15	-.008; 6000 N!
PARAMETER G(BCC_A2,FE:VA;0)	298.15	+GHSEFFE#; 6000 N!
PARAMETER TC(BCC_A2,FE:VA;0)	298.15	+1043; 6000 N!
PARAMETER BMAGN(BCC_A2,FE:VA;0)	298.15	+2.22; 6000 N!
PARAMETER G(BCC_A2,NB:VA;0)	298.15	+GHSEARNB#; 6000 N!
PARAMETER G(BCC_A2,SN:VA;0)	298.15	+GBCCSN#; 6000 N!
PARAMETER G(BCC_A2,ZR:VA;0)	298.15	+GBCCZR#; 6000 N!
PARAMETER G(BCC_A2,CR,FE:VA;0)	298.15	2.91404675E+04
		-1.92714308E+01*T; 6000 N!
PARAMETER G(BCC_A2,CR,FE:VA;1)	298.15	-1.53916965E+03; 6000 N!
PARAMETER BMAGN(BCC_A2,CR,FE:VA;0)	298.15	-.85; 6000 N!
PARAMETER TC(BCC_A2,CR,FE:VA;0)	298.15	+1650; 6000 N!
PARAMETER TC(BCC_A2,CR,FE:VA;1)	298.15	+550; 6000 N!
PARAMETER G(BCC_A2,CR,NB:VA;0)	298.15	+5.24229930E+04
		-1.60494401E+01*T; 6000 N!
PARAMETER G(BCC_A2,CR,NB:VA;1)	298.15	+1.1827496E+04; 6000 N!
PARAMETER G(BCC_A2,CR,SN:VA;0)	298.15	+240000; 6000 N!
PARAMETER G(BCC_A2,CR,SN:VA;1)	298.15	+105000; 6000 N!
PARAMETER G(BCC_A2,CR,ZR:VA;0)	298.15	7.5831825E+04-31.779770*T;
		6000 N!
PARAMETER G(BCC_A2,CR,ZR:VA;1)	298.15	1.7682776E+04-11.343029*T;
		6000 N!
PARAMETER G(BCC_A2,FE,NB:VA;0)	298.15	-13127+11.835*T; 6000 N!
PARAMETER G(BCC_A2,FE,NB:VA;1)	298.15	+6812-7.256*T; 6000 N!
PARAMETER G(BCC_A2,FE,SN:VA;0)	298.15	+3.0E+04
		+5.3132504*T; 6000 N !
PARAMETER G(BCC_A2,FE,SN:VA;1)	298.15	-2.4443000E+04; 6000 N !
PARAMETER TC(BCC_A2,FE,SN:VA;0)	298.15	+918; 6000 N !
PARAMETER BMAGN(BCC_A2,FE,SN:VA;0)	298.15	-5.688; 6000 N !

PARAMETER G(BCC_A2,FE,ZR:VA;0)	298.15	40000		
-1.40169186E+01*T; 6000 N!				
PARAMETER G(BCC_A2,FE,ZR:VA;1)	298.15	50000; 6000 N!		
PARAMETER G(BCC_A2,NB,SN:VA;0)	298.15	60092.859-15.72255*T; 6000 N!		
PARAMETER G(BCC_A2,NB,SN:VA;1)	298.15	-130164+46.723093*T; 6000 N!		
PARAMETER G(BCC_A2,NB,ZR:VA;0)	298.15	+1.4389575E+04		
+4.2621477*T; 6000 N!				
PARAMETER G(BCC_A2,NB,ZR:VA;1)	298.15	+3.4170688E+03; 6000 N!		
PARAMETER G(BCC_A2,SN,ZR:VA;0)	298.15	-6.96910873E+04		
-3.83404445E+01*T; 6000 N!				
PARAMETER G(BCC_A2,SN,ZR:VA;1)	298.15	6.68508329E+04		
-3.05051500E+01*T; 6000 N!				
PARAMETER G(BCC_A2,CR,NB,ZR:VA;0)	298.15	-5000; 6000 N!		
PARAMETER G(BCC_A2,CR,NB,ZR:VA;1)	298.15	-10200; 6000 N!		
PARAMETER G(BCC_A2,CR,NB,ZR:VA;2)	298.15	69500; 6000 N!		
PARAMETER G(BCC_A2,NB,SN,ZR:VA;0)	298.15	-320000; 6000 N!		
PARAMETER G(BCC_A2,NB,SN,ZR:VA;1)	298.15	0; 6000 N!		
PARAMETER G(BCC_A2,NB,SN,ZR:VA;2)	298.15	-95000; 6000 N!		
PARAMETER G(BCC_A2,FE,NB,ZR:VA;0)	298.15	000000; 6000 N!		
PARAMETER G(BCC_A2,FE,NB,ZR:VA;1)	298.15	000000; 6000 N!		
PARAMETER G(BCC_A2,FE,NB,ZR:VA;2)	298.15	000000; 6000 N!		

PHASE HCP_A3 % 2 1 .5 !
 CONSTITUENT HCP_A3 :CR,FE,NB,SN,ZR : VA : !

PARAMETER G(HCP_A3,CR:VA;0)	298.15	+GHCPCR#; 6000 N!		
PARAMETER TC(HCP_A3,CR:VA;0)	298.15	-1109; 6000 N!		
PARAMETER BMAGN(HCP_A3,CR:VA;0)	298.15	-2.46; 6000 N!		
PARAMETER G(HCP_A3,FE:VA;0)	298.15	+GHCPFE#; 6000 N!		
PARAMETER G(HCP_A3,NB:VA;0)	298.15	+GHCPNB#; 6000 N!		
PARAMETER G(HCP_A3,SN:VA;0)	298.15	+GHCPSN#; 6000 N!		
PARAMETER G(HCP_A3,ZR:VA;0)	298.15	+GHSERZR#; 6000 N!		
PARAMETER G(HCP_A3,CR,FE:VA;0)	298.15	1.545370238E+04		
-1.30788144E+01*T; 6000 N!				
PARAMETER G(HCP_A3,CR,FE:VA;1)	298.15	5.516450318E+02; 6000 N!		
PARAMETER G(HCP_A3,CR,NB:VA;0)	298.15	-37923.5+20*T; 6000 N!		
PARAMETER G(HCP_A3,CR,NB:VA;1)	298.15	+15349.5; 6000 N!		
PARAMETER G(HCP_A3,CR,SN:VA;0)	298.15	+144328; 6000 N!		
PARAMETER G(HCP_A3,CR,SN:VA;1)	298.15	+129100; 6000 N!		
PARAMETER G(HCP_A3,CR,ZR:VA;0)	298.15	3.4447487E+04+45*T;		
6000 N!				
PARAMETER G(HCP_A3,CR,ZR:VA;1)	298.15	3.4012014E+04+20.00452*T;		
6000 N!				
PARAMETER G(HCP_A3,FE,NB:VA;0)	298.15	25000; 6000 N!		
PARAMETER G(HCP_A3,FE,NB:VA;1)	298.15	-90000; 6000 N!		
PARAMETER G(HCP_A3,FE,SN:VA;0)	298.15	+23510; 6000 N !		
PARAMETER G(HCP_A3,FE,ZR:VA;0)	298.15	25000; 6000 N!		
PARAMETER G(HCP_A3,NB,SN:VA;0)	298.15	-23738.459+50*T; 6000 N!		
PARAMETER G(HCP_A3,NB,SN:VA;1)	298.15	-1.5539143E+05; 6000 N!		
PARAMETER G(HCP_A3,NB,ZR:VA;0)	298.15	+2.4411000E+04; 6000 N!		
PARAMETER G(HCP_A3,SN,ZR:VA;0)	298.15	-9.45981738E+04		
+1.12409845*T; 6000 N!				

PARAMETER G(HCP_A3,SN,ZR:VA;1) 298.15 5.82243352E+04; 6000 N!
PARAMETER G(HCP_A3,FE,SN,ZR:VA;2) 298.15 -700000; 6000 N!

PHASE BCT_A5 % 1 1.0 !
CONSTITUENT BCT_A5 :SN : !

PARAMETER G(BCT_A5,SN;0) 100 +GHSERSN#; 3000 N!

PHASE C54 % 2 2 1 !
CONSTITUENT C54 :SN : ZR : !

PARAMETER G(C54,SN:ZR;0) 298.15 -1.31060501E+05
-3.64625072E-01*T+2*GHSERSN#+GHSERZR#; 6000 N!

PHASE DIAMOND_A4 % 1 1.0 !
CONSTITUENT DIAMOND_A4 :SN : !

PARAMETER G(DIAMOND_A4,SN;0) 100 -9579.608+114.007785*T
-22.972*T*LN(T)-.00813975*T**2+2.7288E-06*T**3+25615*T**(-1); 298.15 Y
-9063.001+104.84654*T-21.5750771*T*LN(T)-.008575282*T**2
+1.784447E-06*T**3-2544*T**(-1); 800 Y
-10909.353+147.396537*T-28.4512*T*LN(T); 3000 N!

PHASE ETA % 3 5 3 1 !
CONSTITUENT ETA :ZR : SN : SN,VA : !

PARAMETER G(ETA,ZR:SN:SN;0) 298.15 -5.23879753E+05
-7.56093705*T+4*GHSERSN#+5*GHSERZR#; 6000 N!

PARAMETER G(ETA,ZR:SN:VA;0) 298.15 -4.46500931E+05-
7.56093705*T
+3*GHSERSN#+5*GHSERZR#; 6000 N!

PARAMETER G(ETA,ZR:SN:SN,VA;0) 298.15 2.73186606E+02; 6000 N!
PARAMETER G(ETA,ZR:SN:SN,VA;1) 298.15 -2.35345135E+04; 6000 N!

PHASE LAVES_C14 % 3 4 2 6 !
CONSTITUENT LAVES_C14 :CR,FE,NB,SN,ZR : CR,FE,NB,SN,ZR : CR,FE,NB,SN,ZR
: !

\$ Elements purs

PARAMETER G(LAVES_C14,CR:CR:CR;0) 298.15 +342290.49
+12*GHSERCR#; 6000 N!

PARAMETER G(LAVES_C14,FE:FE:FE;0) 298.15 148839.37
+12*GHSERFE; 6000 N!

PARAMETER G(LAVES_C14,NB:NB:NB;0) 298.15 +188611.85
+12*GHSERNB#; 6000 N!

PARAMETER G(LAVES_C14,SN:SN:SN;0) 298.15 +136760.4
+12*GHSERSN#; 6000 N!

PARAMETER G(LAVES_C14,ZR:ZR:ZR;0) 298.15 +282926.23
+12*GHSERZR#; 6000 N !

\$ Cr-Fe

PARAMETER G(LAVES_C14,FE:CR:CR;0) +8*GHSERCR+4*GHSERFE; 6000 N!	298.15 347505.48
PARAMETER G(LAVES_C14,CR:FE:CR;0) +10*GHSERCR+2*GHSERFE; 6000 N!	298.15 257560.82
PARAMETER G(LAVES_C14,FE:FE:CR;0) +6*GHSERCR+6*GHSERFE; 6000 N!	298.15 290386.48
PARAMETER G(LAVES_C14,CR:CR:FE;0) +6*GHSERCR+6*GHSERFE; 6000 N!	298.15 172628.09
PARAMETER G(LAVES_C14,CR:FE:FE;0) +4*GHSERCR+8*GHSERFE; 6000 N!	298.15 174132.04
PARAMETER G(LAVES_C14,FE:CR:FE;0) +2*GHSERCR+10*GHSERFE; 6000 N!	298.15 149253.48

\$ Cr-Nb

PARAMETER G(LAVES_C14,CR:NB:CR;0) +10*GHSERCR#+2*GHSERNB#; 6000 N!	298.15 +591586.16
PARAMETER G(LAVES_C14,NB:CR:CR;0) +4*GHSERNB#; 6000 N!	298.15 -20160.01+8*GHSERCR#
PARAMETER G(LAVES_C14,CR:CR:NB;0) +6*GHSERNB#; 6000 N!	298.15 +723727.6+6*GHSERCR#
PARAMETER G(LAVES_C14,NB:NB:CR;0) +6*GHSERNB#; 6000 N!	298.15 +106457.2+6*GHSERCR#
PARAMETER G(LAVES_C14,CR:NB:NB;0) +8*GHSERNB#; 6000 N!	298.15 +930026+4*GHSERCR#
PARAMETER G(LAVES_C14,NB:CR:NB;0) +2*GHSERCR#+10*GHSERNB#; 6000 N!	298.15 +159921.66

\$ Cr-Sn

PARAMETER G(LAVES_C14,CR:SN:CR;0) +2*GHSERSN#; 6000 N!	298.15 +493622+10*GHSERCR#
PARAMETER G(LAVES_C14,SN:CR:CR;0) +4*GHSERSN#; 6000 N!	298.15 +434780+8*GHSERCR#
PARAMETER G(LAVES_C14,CR:CR:SN;0) +6*GHSERSN#; 6000 N!	298.15 +514790+6*GHSERCR#
PARAMETER G(LAVES_C14,SN:SN:CR;0) +6*GHSERSN#; 6000 N!	298.15 +1165881+6*GHSERCR#
PARAMETER G(LAVES_C14,CR:SN:SN;0) +8*GHSERSN#; 6000 N!	298.15 +765356+4*GHSERCR#
PARAMETER G(LAVES_C14,SN:CR:SN;0) +10*GHSERSN#; 6000 N!	298.15 +251386+2*GHSERCR#

\$ Cr-Zr

PARAMETER G(LAVES_C14,CR:ZR:CR;0) +10*GHSERCR#; 6000 N!	298.15 +675355.2+2*GHSERZR#
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PARAMETER G(LAVES_C14,ZR:CR:CR;0)	298.15	-2.010158E+04-56.549943*T
+4*GHSERZR#+8*GHSERCR#; 6000 N !		
PARAMETER G(LAVES_C14,CR:CR:ZR;0)	298.15	+809014.66
+6*GHSERZR#+6*GHSERCR#; 6000 N !		
PARAMETER G(LAVES_C14,ZR:ZR:CR;0)	298.15	+166977.92
+6*GHSERZR#+6*GHSERCR#; 6000 N !		
PARAMETER G(LAVES_C14,CR:ZR:ZR;0)	298.15	+1155553.45
+8*GHSERZR#+4*GHSERCR#; 6000 N !		
PARAMETER G(LAVES_C14,ZR:CR:ZR;0)	298.15	+207810.99
+10*GHSERZR#+2*GHSERCR#; 6000 N !		
PARAMETER G(LAVES_C14,CR,ZR:CR:CR;0)	298.15	2.0004E+04+10.044567*T;
6000 N !		
PARAMETER G(LAVES_C14,ZR:CR:CR,ZR;0)	298.15	-2.250E+04-8.9287400*T;
6000 N !		

\$ Fe-Nb

PARAMETER G(LAVES_C14,FE:NB:FE;0)	298.15	209135.54+10*GHSERFE#
+2*GHSERNB#; 6000 N!		
PARAMETER G(LAVES_C14,NB:FE:FE;0)	298.15	-237991+38.7696531*T
+8*GHSERFE#+4*GHSERNB#; 6000 N!		
PARAMETER G(LAVES_C14,FE:FE:NB;0)	298.15	+492691.98+6*GHSERFE#
+6*GHSERNB#; 6000 N!		
PARAMETER G(LAVES_C14,NB:NB:FE;0)	298.15	-63529.15+6*GHSERFE#
+6*GHSERNB#; 6000 N!		
PARAMETER G(LAVES_C14,FE:NB:NB;0)	298.15	+682920+4*GHSERFE#
+8*GHSERNB#; 6000 N!		
PARAMETER G(LAVES_C14,NB:FE:NB;0)	298.15	+120678.84+2*GHSERFE#
+10*GHSERNB#; 6000 N!		
PARAMETER G(LAVES_C14,FE,NB:FE:FE;0)	298.15	-175475.251
+38.2965431*T; 6000 N!		
PARAMETER G(LAVES_C14,NB:FE,NB:FE,NB;0)	298.15	-85624;
6000 N!		

\$ Fe-Sn

PARAMETER G(LAVES_C14,FE:SN:FE;0)	298.15	237074.43+10*GHSERFE#
+2*GHSERSN#; 6000 N!		
PARAMETER G(LAVES_C14,SN:FE:FE;0)	298.15	145561.13+8*GHSERFE#
+4*GHSERSN#; 6000 N!		
PARAMETER G(LAVES_C14,FE:FE:SN;0)	298.15	635963.84+6*GHSERFE#
+6*GHSERSN#; 6000 N!		
PARAMETER G(LAVES_C14,SN:SN:FE;0)	298.15	247865.87+6*GHSERFE#
+6*GHSERSN#; 6000 N!		
PARAMETER G(LAVES_C14,FE:SN:SN;0)	298.15	819584.16+4*GHSERFE#
+8*GHSERSN#; 6000 N!		
PARAMETER G(LAVES_C14,SN:FE:SN;0)	298.15	266601.75+2*GHSERFE#
+10*GHSERSN#; 6000 N!		

§ Fe-Zr

PARAMETER G(LAVES_C14,FE:ZR:FE;0) +2*GHSERZR#; 6000 N!	298.15 250115.19+10*GHSERFE#
PARAMETER G(LAVES_C14,ZR:FE:FE;0) +4*GHSERZR#; 6000 N!	298.15 -315773.37+8*GHSERFE#
PARAMETER G(LAVES_C14,FE:FE:ZR;0) +6*GHSERZR#; 6000 N!	298.15 352911.56+6*GHSERFE#
PARAMETER G(LAVES_C14,ZR:ZR:FE;0) +6*GHSERZR#; 6000 N!	298.15 -155030.43+6*GHSERFE#
PARAMETER G(LAVES_C14,FE:ZR:ZR;0) +8*GHSERZR#; 6000 N!	298.15 882932.46+4*GHSERFE#
PARAMETER G(LAVES_C14,ZR:FE:ZR;0) +10*GHSERZR#; 6000 N!	298.15 -11509.69+2*GHSERFE#

§ Nb-Sn

PARAMETER G(LAVES_C14,NB:SN:NB;0) +2*GHSERSN#; 6000 N !	298.15 +84214+10*GHSERNB#
PARAMETER G(LAVES_C14,SN:NB:NB;0) +4*GHSERSN#; 6000 N !	298.15 +216872+8*GHSERNB#
PARAMETER G(LAVES_C14,NB:NB:SN;0) +6*GHSERSN#; 6000 N !	298.15 +359704+6*GHSERNB#
PARAMETER G(LAVES_C14,SN:SN:NB;0) +6*GHSERSN#; 6000 N !	298.15 +163101+6*GHSERNB#
PARAMETER G(LAVES_C14,NB:SN:SN;0) +8*GHSERSN#; 6000 N !	298.15 +759611+4*GHSERNB#
PARAMETER G(LAVES_C14,SN:NB:SN;0) +10*GHSERSN#; 6000 N !	298.15 +182699+2*GHSERNB#

§ Nb-Zr

PARAMETER G(LAVES_C14,NB:ZR:NB;0) +2*GHSERZR#; 6000 N !	298.15 +270876.57+10*GHSERNB#
PARAMETER G(LAVES_C14,ZR:NB:NB;0) +4*GHSERZR#; 6000 N !	298.15 +31792.010+8*GHSERNB#
PARAMETER G(LAVES_C14,NB:NB:ZR;0) +6*GHSERZR#; 6000 N !	298.15 +443420.54+6*GHSERNB#
PARAMETER G(LAVES_C14,ZR:ZR:NB;0) +6*GHSERZR#; 6000 N !	298.15 +104099.37+6*GHSERNB#
PARAMETER G(LAVES_C14,NB:ZR:ZR;0) +8*GHSERZR#; 6000 N !	298.15 +491049.23+4*GHSERNB#
PARAMETER G(LAVES_C14,ZR:NB:ZR;0) +10*GHSERZR#; 6000 N !	298.15 +244274.32+2*GHSERNB#

§ Sn-Zr

PARAMETER G(LAVES_C14,SN:ZR:SN;0) +2*GHSERZR#; 6000 N !	298.15 -7803.59+10*GHSERSN#
PARAMETER G(LAVES_C14,ZR:SN:SN;0) +4*GHSERZR#; 6000 N !	298.15 218147.85+8*GHSERSN#

PARAMETER G(LAVES_C14,SN:SN:ZR;0) +6*GHSEZR#; 6000 N !	298.15	-180800.47+6*GHSEZR#
PARAMETER G(LAVES_C14,ZR:ZR:SN;0) +6*GHSEZR#; 6000 N !	298.15	-229854.69+6*GHSEZR#
PARAMETER G(LAVES_C14,SN:ZR:ZR;0) +8*GHSEZR#; 6000 N !	298.15	65760.05+4*GHSEZR#
PARAMETER G(LAVES_C14,ZR:SN:ZR;0) +10*GHSEZR#; 6000 N !	298.15	-97891.46+2*GHSEZR#

§ Cr-Fe-Nb

PARAMETER G(LAVES_C14,CR:FE:NB;0) +2*GHSEFE#+6*GHSENB#; 6000 N !	298.15	593258.1+4*GHSECR#
PARAMETER G(LAVES_C14,NB:FE:CR;0) +2*GHSEFE#+4*GHSENB#; 6000 N !	298.15	-62795.69+6*GHSECR#
PARAMETER G(LAVES_C14,FE:NB:CR;0) +4*GHSEFE#+2*GHSENB#; 6000 N !	298.15	500130.79+6*GHSECR#
PARAMETER G(LAVES_C14,FE:CR:NB;0) +4*GHSEFE#+6*GHSENB#; 6000 N !	298.15	602467.96+2*GHSECR#
PARAMETER G(LAVES_C14,NB:CR:FE;0) +6*GHSEFE#+4*GHSENB#; 6000 N !	298.15	-146641.44+2*GHSECR#
PARAMETER G(LAVES_C14,CR:NB:FE;0) +6*GHSEFE#+2*GHSENB#; 6000 N !	298.15	334466.13+4*GHSECR#
PARAMETER G(LAVES_C14,NB:CR,FE:FE;0)	298.15	-167380+35*T; 6000 N!
PARAMETER G(LAVES_C14,NB:CR,FE:CR;0)	298.15	-225675-70*T; 6000 N!
PARAMETER G(LAVES_C14,FE,NB:CR:FE;0)	298.15	-280000; 6000 N!
PARAMETER G(LAVES_C14,CR,NB:FE:CR;0)	298.15	-450000; 6000 N!
PARAMETER G(LAVES_C14,NB:FE,CR:FE,CR;0)	298.15	00000; 6000 N!

§ Cr-Fe-Sn

PARAMETER G(LAVES_C14,CR:FE:SN;0) +2*GHSEFE#+6*GHSESN#; 6000 N !	298.15	662283.12+4*GHSECR#
PARAMETER G(LAVES_C14,SN:FE:CR;0) +2*GHSEFE#+4*GHSESN#; 6000 N !	298.15	427370.51+6*GHSECR#
PARAMETER G(LAVES_C14,FE:SN:CR;0) +4*GHSEFE#+2*GHSESN#; 6000 N !	298.15	552233.44+6*GHSECR#
PARAMETER G(LAVES_C14,FE:CR:SN;0) +4*GHSEFE#+6*GHSESN#; 6000 N !	298.15	727353.95+2*GHSECR#
PARAMETER G(LAVES_C14,SN:CR:FE;0) +6*GHSEFE#+4*GHSESN#; 6000 N !	298.15	350184.47+2*GHSECR#
PARAMETER G(LAVES_C14,CR:SN:FE;0) +6*GHSEFE#+2*GHSESN#; 6000 N !	298.15	377902.95+4*GHSECR#

§ Cr-Fe-Zr

PARAMETER G(LAVES_C14,CR:FE:ZR;0) +2*GHSEFE#+6*GHSEZR#; 6000 N !	298.15	350873.17+4*GHSECR#
PARAMETER G(LAVES_C14,ZR:FE:CR;0) +2*GHSEFE#+4*GHSEZR#; 6000 N !	298.15	-87248.12+6*GHSECR#
PARAMETER G(LAVES_C14,FE:ZR:CR;0)	298.15	669721.05+6*GHSECR#

+4*GHSE _R FE#+2*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,FE:CR:ZR;0)	298.15	580965.07+2*GHSE _R CR#	
+4*GHSE _R FE#+6*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,ZR:CR:FE;0)	298.15	-227433.93+2*GHSE _R CR#	
+6*GHSE _R FE#+4*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,CR:ZR:FE;0)	298.15	419674.89+4*GHSE _R CR#	
+6*GHSE _R FE#+2*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,ZR:CR,FE:CR;0)	298.15	-2.50612670E+05	
+4.00604980E+01*T; 6000 N!			
PARAMETER G(LAVES_C14,ZR:CR,FE:FE;0)	298.15	-4.01477708E+05; 6000	
N!			
PARAMETER G(LAVES_C14,ZR:CR,FE:CR,FE;0)	298.15	-3.91598170E+05; 6000	
N!			
§ Cr-Nb-Sn			
PARAMETER G(LAVES_C14,CR:NB:SN;0)	298.15	676249.24+4*GHSE _R CR#	
+2*GHSE _R NB#+6*GHSE _R SN#; 6000 N !			
PARAMETER G(LAVES_C14,NB:SN:CR;0)	298.15	-17107.21+6*GHSE _R CR#	
+4*GHSE _R NB#+2*GHSE _R SN#; 6000 N !			
PARAMETER G(LAVES_C14,NB:CR:SN;0)	298.15	382817.78+2*GHSE _R CR#	
+4*GHSE _R NB#+6*GHSE _R SN#; 6000 N !			
PARAMETER G(LAVES_C14,SN:NB:CR;0)	298.15	383249.83+6*GHSE _R CR#	
+2*GHSE _R NB#+4*GHSE _R SN#; 6000 N !			
PARAMETER G(LAVES_C14,CR:SN:NB;0)	298.15	823755.82+4*GHSE _R CR#	
+6*GHSE _R NB#+2*GHSE _R SN#; 6000 N !			
PARAMETER G(LAVES_C14,SN:CR:NB;0)	298.15	308296.71+2*GHSE _R CR#	
+6*GHSE _R NB#+4*GHSE _R SN#; 6000 N !			
§ Cr-Nb-Zr			
PARAMETER G(LAVES_C14,CR:NB:ZR;0)	298.15	753299.46+4*GHSE _R CR#	
+2*GHSE _R NB#+6*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,ZR:NB:CR;0)	298.15	50676.13+6*GHSE _R CR#	
+2*GHSE _R NB#+4*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,NB:ZR:CR;0)	298.15	232336.69+6*GHSE _R CR#	
+4*GHSE _R NB#+2*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,NB:CR:ZR;0)	298.15	335767.45+2*GHSE _R CR#	
+4*GHSE _R NB#+6*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,ZR:CR:NB;0)	298.15	60678.11+2*GHSE _R CR#	
+6*GHSE _R NB#+4*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,CR:ZR:NB;0)	298.15	986560.03+4*GHSE _R CR#	
+6*GHSE _R NB#+2*GHSE _R ZR#; 6000 N !			
§ Cr-Sn-Zr			
PARAMETER G(LAVES_C14,ZR:SN:CR;0)	298.15	-192018.13-40*T+6*GHSE _R CR#	
+2*GHSE _R SN#+4*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,SN:CR:ZR;0)	298.15	132860.41+2*GHSE _R CR#	
+4*GHSE _R SN#+6*GHSE _R ZR#; 6000 N !			
PARAMETER G(LAVES_C14,SN:ZR:CR;0)	298.15	407848.31+6*GHSE _R CR#	

+4*GHSERSN#+2*GHSERZR#; 6000 N !		
PARAMETER G(LAVES_C14,CR:SN:ZR;0)	298.15	966809.95+4*GHSERCR#
+2*GHSERSN#+6*GHSERZR#; 6000 N !		
PARAMETER G(LAVES_C14,CR:ZR:SN;0)	298.15	531853.43+4*GHSERCR#
+6*GHSERSN#+2*GHSERZR#; 6000 N !		
PARAMETER G(LAVES_C14,ZR:CR:SN;0)	298.15	-77206.91+2*GHSERCR#
+6*GHSERSN#+4*GHSERZR#; 6000 N !		
PARAMETER G(LAVES_C14,ZR:CR,SN:CR;0)	298.15	-105000;
6000 N !		

\$ Fe-Nb-Sn

PARAMETER G(LAVES_C14,FE:NB:SN;0)	298.15	830267.78+4*GHSERFE#
+2*GHSERNB#+6*GHSERSN#; 6000 N !		
PARAMETER G(LAVES_C14,NB:SN:FE;0)	298.15	-58986.3+6*GHSERFE#
+4*GHSERNB#+2*GHSERSN#; 6000 N !		
PARAMETER G(LAVES_C14,NB:FE:SN;0)	298.15	283489.94+2*GHSERFE#
+4*GHSERNB#+6*GHSERSN#; 6000 N !		
PARAMETER G(LAVES_C14,SN:NB:FE;0)	298.15	225731.32+6*GHSERFE#
+2*GHSERNB#+4*GHSERSN#; 6000 N !		
PARAMETER G(LAVES_C14,FE:SN:NB;0)	298.15	696281.85+4*GHSERFE#
+6*GHSERNB#+2*GHSERSN#; 6000 N !		
PARAMETER G(LAVES_C14,SN:FE:NB;0)	298.15	263228.6+2*GHSERFE#
+6*GHSERNB#+4*GHSERSN#; 6000 N !		

\$ Fe-Nb-Zr

PARAMETER G(LAVES_C14,FE:NB:ZR;0)	298.15	791789.62+4*GHSERFE#
+2*GHSERNB#+6*GHSERZR#; 6000 N !		
PARAMETER G(LAVES_C14,NB:ZR:FE;0)	298.15	52449.98+6*GHSERFE#
+4*GHSERNB#+2*GHSERZR#; 6000 N !		
PARAMETER G(LAVES_C14,NB:FE:ZR;0)	298.15	130401.92+2*GHSERFE#
+4*GHSERNB#+6*GHSERZR#; 6000 N !		
PARAMETER G(LAVES_C14,ZR:NB:FE;0)	298.15	-212044.73+6*GHSERFE#
+2*GHSERNB#+4*GHSERZR#; 6000 N !		
PARAMETER G(LAVES_C14,FE:ZR:NB;0)	298.15	783282.23+4*GHSERFE#
+6*GHSERNB#+2*GHSERZR#; 6000 N !		
PARAMETER G(LAVES_C14,ZR:FE:NB;0)	298.15	-62623.21+2*GHSERFE#
+6*GHSERNB#+4*GHSERZR#; 6000 N !		

PARAMETER G(LAVES_C14,ZR:FE,NB:FE;0)	298.15	-2.73370695E+05; 6000 N
!		
PARAMETER G(LAVES_C14,ZR:FE,NB:NB;0)	298.15	9.33082707E+04; 6000 N
!		
PARAMETER G(LAVES_C14,ZR:FE,NB:FE,NB;0)	298.15	-4.79999982E+05; 6000 N
N !		
PARAMETER G(LAVES_C14,ZR:FE,NB:FE,NB;1)	298.15	-2.03917923E+05; 6000 N
N !		
PARAMETER G(LAVES_C14,ZR,NB:FE:FE;0)	298.15	1.11405255E+05; 6000 N
!		

§ Fe-Sn-Zr

PARAMETER G(LAVES_C14,FE:SN:ZR;0)	298.15	846468.15+4*GHSE _R FE#
+2*GHSE _R SN#+6*GHSE _R ZR#; 6000 N !		
PARAMETER G(LAVES_C14,SN:ZR:FE;0)	298.15	156183.94+6*GHSE _R FE#
+4*GHSE _R SN#+2*GHSE _R ZR#; 6000 N !		
PARAMETER G(LAVES_C14,SN:FE:ZR;0)	298.15	-44457.99+2*GHSE _R FE#
+4*GHSE _R SN#+6*GHSE _R ZR#; 6000 N !		
PARAMETER G(LAVES_C14,ZR:SN:FE;0)	298.15	-305871.31+6*GHSE _R FE#
+2*GHSE _R SN#+4*GHSE _R ZR#; 6000 N !		
PARAMETER G(LAVES_C14,FE:ZR:SN;0)	298.15	665829.76+4*GHSE _R FE#
+6*GHSE _R SN#+2*GHSE _R ZR#; 6000 N !		
PARAMETER G(LAVES_C14,ZR:FE:SN;0)	298.15	-120232.08+2*GHSE _R FE#
+6*GHSE _R SN#+4*GHSE _R ZR#; 6000 N !		

§ Nb-Sn-Zr

PARAMETER G(LAVES_C14,SN:NB:ZR;0)	298.15	70870.84+2*GHSE _R NB#
+4*GHSE _R SN#+6*GHSE _R ZR#; 6000 N !		
PARAMETER G(LAVES_C14,ZR:NB:SN;0)	298.15	-138571.36+2*GHSE _R NB#
+6*GHSE _R SN#+4*GHSE _R ZR#; 6000 N !		
PARAMETER G(LAVES_C14,NB:ZR:SN;0)	298.15	306588.24+4*GHSE _R NB#
+6*GHSE _R SN#+2*GHSE _R ZR#; 6000 N !		
PARAMETER G(LAVES_C14,NB:SN:ZR;0)	298.15	232854.78+4*GHSE _R NB#
+2*GHSE _R SN#+6*GHSE _R ZR#; 6000 N !		
PARAMETER G(LAVES_C14,ZR:SN:NB;0)	298.15	-171874.56+6*GHSE _R NB#
+2*GHSE _R SN#+4*GHSE _R ZR#; 6000 N !		
PARAMETER G(LAVES_C14,SN:ZR:NB;0)	298.15	205489.37+6*GHSE _R NB#
+4*GHSE _R SN#+2*GHSE _R ZR#; 6000 N !		

PHASE LAVES_C15 % 2 2 1 !

CONSTITUENT LAVES_C15 :CR,FE,NB,SN,ZR : CR,FE,NB,SN,ZR : !

PARAMETER G(LAVES_C15,CR:CR;0)	298.15	+81517.9+3*GHSE _R CR#;
6000 N!		
PARAMETER G(LAVES_C15,FE:FE;0)	298.15	35876.32+3*GHSE _R FE#;
6000 N!		
PARAMETER G(LAVES_C15,NB:NB;0)	298.15	+49852.8+3*GHSE _R NB#;
6000 N !		
PARAMETER G(LAVES_C15,SN:SN;0)	298.15	+41313.85+3*GHSE _R SN#;
6000 N!		
PARAMETER G(LAVES_C15,ZR:ZR;0)	298.15	+88548.52+3*GHSE _R ZR#;
6000 N!		
PARAMETER G(LAVES_C15,CR:FE;0)	298.15	77642.26+2*GHSE _R CR
+1*GHSE _R FE; 6000 N!		
PARAMETER G(LAVES_C15,FE:CR;0)	298.15	41423.51+1*GHSE _R CR
+2*GHSE _R FE; 6000 N!		
PARAMETER G(LAVES_C15,CR:NB;0)	298.15	-1.1436335E+04
-7.1542789*T+2*GHSE _R CR#+GHSE _R NB#; 6000 N!		

PARAMETER G(LAVES_C15,NB:CR;0)	298.15	
+229013+2*GHSERNB#+GHSERCR#;		
6000 N!		
PARAMETER G(LAVES_C15,CR:SN;0)	298.15	+107211.75+2*GHSERCR#
+GHSERSN#; 6000 N!		
PARAMETER G(LAVES_C15,SN:CR;0)	298.15	+202124.875
+GHSERCR#+2*GHSERSN#; 6000 N!		
PARAMETER G(LAVES_C15,CR:ZR;0)	298.15	-9.9730000E+03
-11.421675*T+GHSERZR#+2*GHSERCR#; 6000 N!		
PARAMETER G(LAVES_C15,ZR:CR;0)	298.15	+313559.474
+2*GHSERZR#+GHSERCR#; 6000 N!		
PARAMETER G(LAVES_C15,FE:NB;0)	298.15	-44603.6+3*T
+2*GHSERFE#+GHSERNB#; 6000 N !		
PARAMETER G(LAVES_C15,NB:FE;0)	298.15	+171959.1+GHSERFE#
+2*GHSERNB#; 6000 N !		
PARAMETER G(LAVES_C15,FE:SN;0)	298.15	33382.40
+2*GHSERFE#+GHSERSN#; 6000 N !		
PARAMETER G(LAVES_C15,SN:FE;0)	298.15	274636.21
+2*GHSERSN#+GHSERFE#; 6000 N !		
PARAMETER G(LAVES_C15,FE:ZR;0)	298.15	-1.05103630E+05
+1.24407647E+01*T+GHSERZR#+2*GHSERFE#; 6000 N!		
PARAMETER G(LAVES_C15,ZR:FE;0)	298.15	+227815+2*GHSERZR#
+GHSERFE#; 6000 N!		
PARAMETER TC(LAVES_C15,FE:ZR;0)	298.15	+584.15; 6000 N!
PARAMETER BMAGN(LAVES_C15,FE:ZR;0)	298.15	+0.05; 6000 N!
PARAMETER G(LAVES_C15,*:FE,ZR;0)	298.15	-2.2000000E+04; 6000 N!
PARAMETER G(LAVES_C15,NB:SN;0)	298.15	+247308.2+GHSERNB#
+1*GHSERSN#; 6000 N !		
PARAMETER G(LAVES_C15,SN:NB;0)	298.15	+51428.4+GHSERNB#
+2*GHSERSN#; 6000 N !		
PARAMETER G(LAVES_C15,NB:ZR;0)	298.15	+13904.474
+2*GHSERNB#+GHSERZR#; 6000 N!		
PARAMETER G(LAVES_C15,ZR:NB;0)	298.15	145110
+GHSERZR#+2*GHSERNB#; 6000 N!		
PARAMETER G(LAVES_C15,SN:ZR;0)	298.15	73306.3
+2*GHSERSN#+GHSERZR#; 6000 N !		
PARAMETER G(LAVES_C15,ZR:SN;0)	298.15	11556.64
+2*GHSERZR#+GHSERSN#; 6000 N !		
PARAMETER G(LAVES_C15,CR:CR,ZR;0)	298.15	-8.9758835E+03; 6000 N!
PARAMETER G(LAVES_C15,CR,ZR:ZR;0)	298.15	-1.5150000E+04; 6000 N!
PARAMETER G(LAVES_C15,CR:CR,NB;0)	298.15	-4.1015233E+04; 6000 N!
PARAMETER G(LAVES_C15,CR,NB:NB;0)	298.15	+4.0303103E+04; 6000 N!
PARAMETER G(LAVES_C15,CR,FE:NB;0)	298.15	-56158+20*T; 6000 N!
PARAMETER G(LAVES_C15,CR:ZR,CR,NB;0)	298.15	-140650; 6000 N!
PARAMETER G(LAVES_C15,CR:NB,ZR;0)	298.15	-18000; 6000 N!
PARAMETER G(LAVES_C15,FE,NB:ZR;0)	298.15	40000; 6000 N!
PARAMETER G(LAVES_C15,CR,FE:ZR;0)	298.15	-8.96505316E+04
+5.18263100E+01*T; 6000 N!		
PARAMETER G(LAVES_C15,CR,FE:ZR;1)	298.15	0000; 6000 N!
PARAMETER G(LAVES_C15,CR,FE:ZR;2)	298.15	-5.75417411E+04
+10*T; 6000 N!		

PARAMETER G(LAVES_C15,FE:SN,ZR;0) 298.15 -110000; 6000 N!

PHASE LAVES_C36 % 3 4 4 16 !

CONSTITUENT LAVES_C36 :CR,FE,NB,SN,ZR : CR,FE,NB,SN,ZR : CR,FE,NB,SN,ZR
: !

\$ Elements purs

PARAMETER G(LAVES_C36,CR:CR:CR;0) 298.15 +621157
+24*GHSERCR#; 6000 N!
PARAMETER G(LAVES_C36,FE:FE:FE;0) 298.15 290739.05
+24*GHSERFE#; 6000 N!
PARAMETER G(LAVES_C36,NB:NB:NB;0) 298.15 +392133
+24*GHSERNB#; 6000 N!
PARAMETER G(LAVES_C36,SN:SN:SN;0) 298.15 +297926
+24*GHSERSN#; 6000 N!
PARAMETER G(LAVES_C36,ZR:ZR:ZR;0) 298.15 +618996.87
+24*GHSERZR#; 6000 N!

\$ Cr-Fe

PARAMETER G(LAVES_C36,FE:CR:CR;0) 298.15 591145.14+20*GHSERCR#
+4*GHSERFE#; 6000 N!
PARAMETER G(LAVES_C36,CR:FE:CR;0) 298.15 614866.36+20*GHSERCR#
+4*GHSERFE#; 6000 N!
PARAMETER G(LAVES_C36,FE:FE:CR;0) 298.15 662413.49+16*GHSERCR#
+8*GHSERFE#; 6000 N!
PARAMETER G(LAVES_C36,CR:CR:FE;0) 298.15 495524.95+8*GHSERCR#
+16*GHSERFE#; 6000 N!
PARAMETER G(LAVES_C36,FE:CR:FE;0) 298.15 317201.51+4*GHSERCR#
+20*GHSERFE#; 6000 N!
PARAMETER G(LAVES_C36,CR:FE:FE;0) 298.15 267175.01+4*GHSERCR#
+20*GHSERFE#; 6000 N!

\$ Cr-Nb

PARAMETER G(LAVES_C36,NB:CR:CR;0) 298.15 +344351+20*GHSERCR#
+4*GHSERNB#; 6000 N!
PARAMETER G(LAVES_C36,CR:NB:CR;0) 298.15 +355728+20*GHSERCR#
+4*GHSERNB#; 6000 N!
PARAMETER G(LAVES_C36,NB:NB:CR;0) 298.15 -63552+16*GHSERCR#
+8*GHSERNB#; 6000 N!
PARAMETER G(LAVES_C36,CR:CR:NB;0) 298.15 +3623516+8*GHSERCR#
+16*GHSERNB#; 6000 N!
PARAMETER G(LAVES_C36,NB:CR:NB;0) 298.15 +1124849+4*GHSERCR#
+20*GHSERNB#; 6000 N!
PARAMETER G(LAVES_C36,CR:NB:NB;0) 298.15 +1132038+4*GHSERCR#
+20*GHSERNB#; 6000 N!

\$ Cr-Sn

PARAMETER G(LAVES_C36,CR:SN:CR;0) +4*GHSERSN#; 6000 N!	298.15 639785+20*GHSERCR#
PARAMETER G(LAVES_C36,SN:CR:CR;0) +20*GHSERCR#+4*GHSERSN#; 6000 N!	298.15 +643667
PARAMETER G(LAVES_C36,SN:SN:CR;0) +8*GHSERSN#; 6000 N!	298.15 +850251+16*GHSERCR#
PARAMETER G(LAVES_C36,CR:CR:SN;0) +16*GHSERSN#; 6000 N!	298.15 +1590155+8*GHSERCR#
PARAMETER G(LAVES_C36,SN:CR:SN;0) +20*GHSERSN#+4*GHSERCR#; 6000 N!	298.15 +967990
PARAMETER G(LAVES_C36,CR:SN:SN;0) +20*GHSERSN#; 6000 N!	298.15 +942683+4*GHSERCR#

\$ Cr-Zr

PARAMETER G(LAVES_C36,ZR:CR:CR;0) +4*GHSERZR#+20*GHSERCR#; 6000 N!	298.15 +407178.74
PARAMETER G(LAVES_C36,CR:ZR:CR;0) +4*GHSERZR#+20*GHSERCR#; 6000 N!	298.15 +417367.15
PARAMETER G(LAVES_C36,ZR:ZR:CR;0) -101.41966*T+8*GHSERZR#+16*GHSERCR#; 6000 N!	298.15 -6.2568000E+04
PARAMETER G(LAVES_C36,CR:CR:ZR;0) +16*GHSERZR#+8*GHSERCR#; 6000 N!	298.15 +2011612.83
PARAMETER G(LAVES_C36,ZR:CR:ZR;0) +20*GHSERZR#+4*GHSERCR#; 6000 N!	298.15 +1510437.04
PARAMETER G(LAVES_C36,CR:ZR:ZR;0) +20*GHSERZR#+4*GHSERCR#; 6000 N!	298.15 +1518505.49

\$ Fe-Nb

PARAMETER G(LAVES_C36,NB:FE:FE;0) +20*GHSERFE#+4*GHSERNB#; 6000 N!	298.15 -115330.03
PARAMETER G(LAVES_C36,FE:NB:FE;0) +20*GHSERFE#+4*GHSERNB#; 6000 N!	298.15 -88672.31
PARAMETER G(LAVES_C36,NB:NB:FE;0) +16*GHSERFE#+8*GHSERNB#; 6000 N!	298.15 -344903.96+24*T
PARAMETER G(LAVES_C36,FE:FE:NB;0) +16*GHSERNB#; 6000 N!	298.15 1426114.63+8*GHSERFE#
PARAMETER G(LAVES_C36,NB:FE:NB;0) +20*GHSERNB#; 6000 N!	298.15 1010258.84+4*GHSERFE#
PARAMETER G(LAVES_C36,FE:NB:NB;0) +20*GHSERNB#; 6000 N!	298.15 993353.86+4*GHSERFE#

\$ Fe-Sn

PARAMETER G(LAVES_C36,SN:FE:FE;0) +20*GHSERFE#+4*GHSERSN#; 6000 N!	298.15 187170.41
PARAMETER G(LAVES_C36,FE:SN:FE;0) +20*GHSERFE#+4*GHSERSN#; 6000 N!	298.15 205083.67
PARAMETER G(LAVES_C36,SN:SN:FE;0)	298.15 286725.9

+16*GHSERFE#+8*GHSERSN#; 6000 N!	
PARAMETER G(LAVES_C36,FE:FE:SN;0)	298.15 1930551.53+8*GHSERFE#
+16*GHSERSN#; 6000 N!	
PARAMETER G(LAVES_C36,SN:FE:SN;0)	298.15 1026302.03+4*GHSERFE#
+20*GHSERSN#; 6000 N!	
PARAMETER G(LAVES_C36,FE:SN:SN;0)	298.15 1021720.97+4*GHSERFE#
+20*GHSERSN#; 6000 N!	

§ Fe-Zr

PARAMETER G(LAVES_C36,ZR:FE:FE;0)	298.15 -279299.82
+20*GHSERFE#+4*GHSERZR#; 6000 N!	
PARAMETER G(LAVES_C36,FE:ZR:FE;0)	298.15 -253848.83
+20*GHSERFE#+4*GHSERZR#; 6000 N!	
PARAMETER G(LAVES_C36,ZR:ZR:FE;0)	298.15 -7.00971560E+05
+107.2*T+16*GHSERFE#+8*GHSERZR#; 6000 N!	
PARAMETER G(LAVES_C36,FE:FE:ZR;0)	298.15 +1791026.12+8*GHSERFE#
+16*GHSERZR#; 6000 N!	
PARAMETER G(LAVES_C36,ZR:FE:ZR;0)	298.15 +1419297.01+4*GHSERFE#
+20*GHSERZR#; 6000 N!	
PARAMETER G(LAVES_C36,FE:ZR:ZR;0)	298.15 +1375454.88+4*GHSERFE#
+20*GHSERZR#; 6000 N!	
PARAMETER G(LAVES_C36,ZR:FE,ZR:FE;0)	298.15 -350000; 6000 N!

§ Nb-Sn

PARAMETER G(LAVES_C36,SN:NB:NB;0)	298.15 +331907+20*GHSERNB#
+4*GHSERSN#; 6000 N !	
PARAMETER G(LAVES_C36,NB:SN:NB;0)	298.15 +371372+20*GHSERNB#
+4*GHSERSN#; 6000 N !	
PARAMETER G(LAVES_C36,SN:SN:NB;0)	298.15 +431938+16*GHSERNB#
+8*GHSERSN#; 6000 N !	
PARAMETER G(LAVES_C36,NB:NB:SN;0)	298.15 +1674961+8*GHSERNB#
+16*GHSERSN#; 6000 N !	
PARAMETER G(LAVES_C36,NB:SN:SN;0)	298.15 +849588+4*GHSERNB#
+20*GHSERSN#; 6000 N !	
PARAMETER G(LAVES_C36,SN:NB:SN;0)	298.15 +942463+4*GHSERNB#
+20*GHSERSN#; 6000 N !	

§ Nb-Zr

PARAMETER G(LAVES_C36,NB:ZR:ZR;0)	298.15 840489.44+4*GHSERNB#
+20*GHSERZR#; 6000 N !	
PARAMETER G(LAVES_C36,ZR:NB:ZR;0)	298.15 836181.9+4*GHSERNB#
+20*GHSERZR#; 6000 N !	
PARAMETER G(LAVES_C36,NB:NB:ZR;0)	298.15 1046735.36+8*GHSERNB#
+16*GHSERZR#; 6000 N !	
PARAMETER G(LAVES_C36,ZR:ZR:NB;0)	298.15 98448.0+16*GHSERNB#
+8*GHSERZR#; 6000 N !	
PARAMETER G(LAVES_C36,NB:ZR:NB;0)	298.15 239672.86+20*GHSERNB#
+4*GHSERZR#; 6000 N !	

PARAMETER G(LAVES_C36,ZR:NB:NB;0) 298.15 242056.29+20*GHSERNB#
+4*GHSERZR#; 6000 N !

\$ Sn-Zr

PARAMETER G(LAVES_C36,SN:ZR:ZR;0) 298.15 259599.3+4*GHSERSN#
+20*GHSERZR#; 6000 N !
PARAMETER G(LAVES_C36,ZR:SN:ZR;0) 298.15 289212.03+4*GHSERSN#
+20*GHSERZR#; 6000 N !
PARAMETER G(LAVES_C36,SN:SN:ZR;0) 298.15 101940.7+8*GHSERSN#
+16*GHSERZR#; 6000 N !
PARAMETER G(LAVES_C36,ZR:ZR:SN;0) 298.15 474299.2+16*GHSERSN#
+8*GHSERZR#; 6000 N !
PARAMETER G(LAVES_C36,SN:ZR:SN;0) 298.15 415645.01+20*GHSERSN#
+4*GHSERZR#; 6000 N !
PARAMETER G(LAVES_C36,ZR:SN:SN;0) 298.15 416498.92+20*GHSERSN#
+4*GHSERZR#; 6000 N !

\$ Cr-Fe-Nb

PARAMETER G(LAVES_C36,CR:NB:FE;0) 298.15 72590.45+4*GHSERCR#
+16*GHSERFE#+4*GHSERNB#; 6000 N !
PARAMETER G(LAVES_C36,NB:CR:FE;0) 298.15 165198.78+4*GHSERCR#
+16*GHSERFE#+4*GHSERNB#; 6000 N !
PARAMETER G(LAVES_C36,NB:FE:CR;0) 298.15 16398.36+16*GHSERCR#
+4*GHSERFE#+4*GHSERNB#; 6000 N !
PARAMETER G(LAVES_C36,CR:FE:NB;0) 298.15 1834559.47+4*GHSERCR#
+4*GHSERFE#+16*GHSERNB#; 6000 N !
PARAMETER G(LAVES_C36,FE:NB:CR;0) 298.15 304131.63+16*GHSERCR#
+4*GHSERFE#+4*GHSERNB#; 6000 N !
PARAMETER G(LAVES_C36,FE:CR:NB;0) 298.15 1469312.89+4*GHSERCR#
+4*GHSERFE#+16*GHSERNB#; 6000 N !

\$ Cr-Fe-Sn

PARAMETER G(LAVES_C36,CR:SN:FE;0) 298.15 403859.71+4*GHSERCR#
+16*GHSERFE#+4*GHSERSN#; 6000 N !
PARAMETER G(LAVES_C36,SN:CR:FE;0) 298.15 387129.46+4*GHSERCR#
+16*GHSERFE#+4*GHSERSN#; 6000 N !
PARAMETER G(LAVES_C36,SN:FE:CR;0) 298.15 698619.84+16*GHSERCR#
+4*GHSERFE#+4*GHSERSN#; 6000 N !
PARAMETER G(LAVES_C36,CR:FE:SN;0) 298.15 1673960.4+4*GHSERCR#
+4*GHSERFE#+16*GHSERSN#; 6000 N !
PARAMETER G(LAVES_C36,FE:SN:CR;0) 298.15 682137.04+16*GHSERCR#
+4*GHSERFE#+4*GHSERSN#; 6000 N !
PARAMETER G(LAVES_C36,FE:CR:SN;0) 298.15 1671025.77+4*GHSERCR#
+4*GHSERFE#+16*GHSERSN#; 6000 N !

\$ Cr-Fe-Zr

PARAMETER G(LAVES_C36,CR:ZR:FE;0) 298.15 -42991.23+4*GHSERCR#
+16*GHSERFE#+4*GHSERZR#; 6000 N !

PARAMETER G (LAVES_C36,ZR:CR:FE;0) +16*GHSERFE#+4*GHSERZR#; 6000 N !	298.15	-70419.58+4*GHSERCR#
PARAMETER G (LAVES_C36,ZR:FE:CR;0) +4*GHSERFE#+4*GHSERZR#; 6000 N !	298.15	401816.41+16*GHSERCR#
PARAMETER G (LAVES_C36,CR:FE:ZR;0) +4*GHSERFE#+16*GHSERZR#; 6000 N !	298.15	2040727.51+4*GHSERCR#
PARAMETER G (LAVES_C36,FE:ZR:CR;0) +4*GHSERFE#+4*GHSERZR#; 6000 N !	298.15	364656.0+16*GHSERCR#
PARAMETER G (LAVES_C36,FE:CR:ZR;0) +4*GHSERFE#+16*GHSERZR#; 6000 N !	298.15	1937196.35+4*GHSERCR#

§ Cr-Nb-Sn

PARAMETER G (LAVES_C36,NB:CR:SN;0) +4*GHSERNB#+16*GHSERSN#; 6000 N !	298.15	1588883.81+4*GHSERCR#
PARAMETER G (LAVES_C36,NB:SN:CR;0) +4*GHSERNB#+4*GHSERSN#; 6000 N !	298.15	145348.9+16*GHSERCR#
PARAMETER G (LAVES_C36,CR:NB:SN;0) +4*GHSERNB#+16*GHSERSN#; 6000 N !	298.15	1501474.09+4*GHSERCR#
PARAMETER G (LAVES_C36,SN:NB:CR;0) +4*GHSERNB#+4*GHSERSN#; 6000 N !	298.15	143498.78+16*GHSERCR#
PARAMETER G (LAVES_C36,CR:SN:NB;0) +16*GHSERNB#+4*GHSERSN#; 6000 N !	298.15	983794.43+4*GHSERCR#
PARAMETER G (LAVES_C36,SN:CR:NB;0) +16*GHSERNB#+4*GHSERSN#; 6000 N !	298.15	906444.02+4*GHSERCR#

§ Cr-Nb-Zr

PARAMETER G (LAVES_C36,CR:ZR:NB;0) +16*GHSERNB#+4*GHSERZR#; 6000 N !	298.15	847499.87+4*GHSERCR#
PARAMETER G (LAVES_C36,ZR:CR:NB;0) +16*GHSERNB#+4*GHSERZR#; 6000 N !	298.15	829117.11+4*GHSERCR#
PARAMETER G (LAVES_C36,ZR:NB:CR;0) +4*GHSERNB#+4*GHSERZR#; 6000 N !	298.15	-70241.42+15*T+16*GHSERCR#
PARAMETER G (LAVES_C36,CR:NB:ZR;0) +4*GHSERNB#+16*GHSERZR#; 6000 N !	298.15	1756054.7+4*GHSERCR#
PARAMETER G (LAVES_C36,NB:ZR:CR;0) +4*GHSERNB#+4*GHSERZR#; 6000 N !	298.15	-67631.61+15*T+16*GHSERCR#
PARAMETER G (LAVES_C36,NB:CR:ZR;0) +4*GHSERNB#+16*GHSERZR#; 6000 N !	298.15	1734866.69+4*GHSERCR#

§ Cr-Sn-Zr

PARAMETER G (LAVES_C36,ZR:SN:CR;0) +4*GHSERSN#+4*GHSERZR#; 6000 N !	298.15	149604.19+16*GHSERCR#
PARAMETER G (LAVES_C36,CR:SN:ZR;0) +4*GHSERSN#+16*GHSERZR#; 6000 N !	298.15	1307473.28+4*GHSERCR#
PARAMETER G (LAVES_C36,CR:ZR:SN;0) +16*GHSERSN#+4*GHSERZR#; 6000 N !	298.15	1048332.03+4*GHSERCR#
PARAMETER G (LAVES_C36,ZR:CR:SN;0) +16*GHSERSN#+4*GHSERZR#; 6000 N !	298.15	1030802.32+4*GHSERCR#

PARAMETER G(LAVES_C36,SN:ZR:CR;0)	298.15	148835.55+16*GHSECR#
+4*GHSECRSN#+4*GHSECRZR#; 6000 N !		
PARAMETER G(LAVES_C36,SN:CR:ZR;0)	298.15	889552.54+4*GHSECR#
+4*GHSECRSN#+16*GHSECRZR#; 6000 N !		

\$ Fe-Nb-Sn

PARAMETER G(LAVES_C36,NB:SN:FE;0)	298.15	-191483.09+16*GHSEFE#
+4*GHSEFE#NB#+4*GHSEFE#SN#; 6000 N !		
PARAMETER G(LAVES_C36,SN:NB:FE;0)	298.15	-204576.76+16*GHSEFE#
+4*GHSEFE#NB#+4*GHSEFE#SN#; 6000 N !		
PARAMETER G(LAVES_C36,FE:NB:SN;0)	298.15	1781043.1+4*GHSEFE#
+4*GHSEFE#NB#+16*GHSEFE#SN#; 6000 N !		
PARAMETER G(LAVES_C36,NB:FE:SN;0)	298.15	1676344.89+4*GHSEFE#
+4*GHSEFE#NB#+16*GHSEFE#SN#; 6000 N !		
PARAMETER G(LAVES_C36,FE:SN:NB;0)	298.15	939519.9+4*GHSEFE#
+16*GHSEFE#NB#+4*GHSEFE#SN#; 6000 N !		
PARAMETER G(LAVES_C36,SN:FE:NB;0)	298.15	899991.01+4*GHSEFE#
+16*GHSEFE#NB#+4*GHSEFE#SN#; 6000 N !		

\$ Fe-Nb-Zr

PARAMETER G(LAVES_C36,ZR:NB:FE;0)	298.15	-475768.72+16*GHSEFE#
+4*GHSEFE#NB#+4*GHSEFE#ZR#; 6000 N !		
PARAMETER G(LAVES_C36,NB:ZR:FE;0)	298.15	-457974.39+16*GHSEFE#
+4*GHSEFE#NB#+4*GHSEFE#ZR#; 6000 N !		
PARAMETER G(LAVES_C36,FE:NB:ZR;0)	298.15	1629161.51+4*GHSEFE#
+4*GHSEFE#NB#+16*GHSEFE#ZR#; 6000 N !		
PARAMETER G(LAVES_C36,NB:FE:ZR;0)	298.15	1712687.74+4*GHSEFE#
+4*GHSEFE#NB#+16*GHSEFE#ZR#; 6000 N !		
PARAMETER G(LAVES_C36,FE:ZR:NB;0)	298.15	1034449.81+4*GHSEFE#
+16*GHSEFE#NB#+4*GHSEFE#ZR#; 6000 N !		
PARAMETER G(LAVES_C36,ZR:FE:NB;0)	298.15	1000379.26+4*GHSEFE#
+16*GHSEFE#NB#+4*GHSEFE#ZR#; 6000 N !		

\$ Fe-Sn-Zr

PARAMETER G(LAVES_C36,FE:ZR:SN;0)	298.15	1205127.03+4*GHSEFE#
+16*GHSEFE#SN#+4*GHSEFE#ZR#; 6000 N !		
PARAMETER G(LAVES_C36,FE:SN:ZR;0)	298.15	975964.83+4*GHSEFE#
+4*GHSEFE#SN#+16*GHSEFE#ZR#; 6000 N !		
PARAMETER G(LAVES_C36,ZR:FE:SN;0)	298.15	1135254.58+4*GHSEFE#
+16*GHSEFE#SN#+4*GHSEFE#ZR#; 6000 N !		
PARAMETER G(LAVES_C36,SN:FE:ZR;0)	298.15	1175979.59+4*GHSEFE#
+4*GHSEFE#SN#+16*GHSEFE#ZR#; 6000 N !		
PARAMETER G(LAVES_C36,ZR:SN:FE;0)	298.15	-410267.9-109*T
+16*GHSEFE#NB#+4*GHSEFE#SN#+4*GHSEFE#ZR#;	6000 N !	
PARAMETER G(LAVES_C36,SN:ZR:FE;0)	298.15	-368546.27+16*GHSEFE#
+4*GHSEFE#SN#+4*GHSEFE#ZR#; 6000 N !		
PARAMETER G(LAVES_C36,ZR:SN,ZR:FE;0)	298.15	-398285+75*T; 6000 N !

\$ Nb-Sn-Zr

PARAMETER G(LAVES_C36,NB:ZR:SN;0) 298.15 966213.36+4*GHSEARNB#
+16*GHSEARN# +4*GHSEARZR#; 6000 N!
PARAMETER G(LAVES_C36,NB:SN:ZR;0) 298.15 588534.84+4*GHSEARNB#
+4*GHSEARN# +16*GHSEARZR#; 6000 N!
PARAMETER G(LAVES_C36,ZR:NB:SN;0) 298.15 910145.81+4*GHSEARNB#
+16*GHSEARN# +4*GHSEARZR#; 6000 N!
PARAMETER G(LAVES_C36,SN:NB:ZR;0) 298.15 556700.2+4*GHSEARNB#
+4*GHSEARN# +16*GHSEARZR#; 6000 N!
PARAMETER G(LAVES_C36,ZR:SN:NB;0) 298.15 156838.26+16*GHSEARNB#
+4*GHSEARN# +4*GHSEARZR#; 6000 N!
PARAMETER G(LAVES_C36,SN:ZR:NB;0) 298.15 121336.21+16*GHSEARNB#
+4*GHSEARN# +4*GHSEARZR#; 6000 N!

PHASE SIGMA % 2 10 20 !
CONSTITUENT SIGMA :CR,FE,NB : CR,FE,NB : !

PARAMETER G(SIGMA,CR:CR;0) 298.15 3.94756000E+05
+30*GHSEARCR#; 6000 N!
PARAMETER G(SIGMA,FE:FE;0) 298.15 2.26061967E+05
+30*GHSEARFE#; 6000 N!

PARAMETER G(SIGMA,CR:FE;0) 298.15 3.12648830E+05
+10*GHSEARCR# +20*GHSEARFE#; 6000 N!
PARAMETER G(SIGMA,FE:CR;0) 298.15 9.7003960E+04
-1.23246240E+02*T +10*GHSEARFE# +20*GHSEARCR#; 6000 N!
PARAMETER G(SIGMA,FE:CR,FE;0) 298.15 1.63972164E+04-
270.865217*T;
6000 N!

PARAMETER G(SIGMA,NB:NB;0) 298.15 2.447520000E+05
+30*GHSEARNB#; 6000 N!
PARAMETER G(SIGMA,CR:NB;0) 298.15 2.57136E+05
+10*GHSEARCR# +20*GHSEARNB#; 6000 N!
PARAMETER G(SIGMA,NB:CR;0) 298.15 1.26432E+06
+10*GHSEARNB# +20*GHSEARCR#; 6000 N!
PARAMETER G(SIGMA,FE:NB;0) 298.15 3.7251E+04
+10*GHSEARFE# +20*GHSEARNB#; 6000 N!
PARAMETER G(SIGMA,NB:FE;0) 298.15 7.6905E+05
+10*GHSEARNB# +20*GHSEARFE#; 6000 N!

PHASE MU_PHASE % 4 1 4 2 6 !
CONSTITUENT MU_PHASE :CR,FE,NB : NB : CR,FE,NB : CR,FE,NB : !

PARAMETER G(MU_PHASE,CR:NB:CR:CR;0) 298.15
52879+9*GHSEARCR# +4*GHSEARNB#;
6000 N!

PARAMETER G (MU_PHASE, NB:NB:CR:CR; 0)	298.15	
+141350+5*GHSERNB#+8*GHSERCR#;		
6000 N !		
PARAMETER G (MU_PHASE, CR:NB:NB:CR; 0)	298.15	
+11604+7*GHSERCR#+6*GHSERNB#;		
6000 N !		
PARAMETER G (MU_PHASE, NB:NB:NB:CR; 0)	298.15	
+77325+7*GHSERNB#+6*GHSERCR#;		
6000 N !		
PARAMETER G (MU_PHASE, CR:NB:CR:NB; 0)	298.15	
+374342+3*GHSERCR#+10*GHSERNB#;		
6000 N !		
PARAMETER G (MU_PHASE, CR:NB:NB:NB; 0)	298.15	
+222612+GHSERCR#+12*GHSERNB#;		
6000 N !		
PARAMETER G (MU_PHASE, FE:NB:NB:NB; 0)	298.15	+179830+GHSERFE#
+12*GHSERNB#;	6000 N!	
PARAMETER G (MU_PHASE, NB:NB:NB:NB; 0)	298.15	+221890+13*GHSERNB#;
6000 N!		
PARAMETER G (MU_PHASE, FE:NB:FE:FE; 0)	298.15	9*GHSERFE# +4*GHSERNB#
-90419;	6000 N!	
PARAMETER G (MU_PHASE, NB:NB:FE:FE; 0)	298.15	-24646+8*GHSERFE#
+5*GHSERNB#;	6000 N!	
PARAMETER G (MU_PHASE, FE:NB:NB:FE; 0)	298.15	-260187+51.5*T
+7*GHSERFE#+6*GHSERNB#;	6000 N !	
PARAMETER G (MU_PHASE, NB:NB:NB:FE; 0)	298.15	-122654+6*GHSERFE#
+7*GHSERNB#;	6000 N!	
PARAMETER G (MU_PHASE, FE:NB:CR:CR; 0)	298.15	+37263+GHSERFE#+4*GHSERNB#
+8*GHSERCR#;	6000 N !	
PARAMETER G (MU_PHASE, CR:NB:FE:CR; 0)	298.15	
+88465+7*GHSERCR#+4*GHSERNB#		
+2*GHSERFE#;	6000 N !	
PARAMETER G (MU_PHASE, FE:NB:FE:CR; 0)	298.15	
+97266+3*GHSERFE#+4*GHSERNB#		
+6*GHSERCR#;	6000 N !	
PARAMETER G (MU_PHASE, NB:NB:FE:CR; 0)	298.15	
+191535+5*GHSERNB#+2*GHSERFE#		
+6*GHSERCR#;	6000 N !	
PARAMETER G (MU_PHASE, FE:NB:NB:CR; 0)	298.15	-10355+GHSERFE#+6*GHSERNB#
+6*GHSERCR#;	6000 N !	
PARAMETER G (MU_PHASE, CR:NB:CR:FE; 0)	298.15	-
49986+3*GHSERCR#+6*GHSERFE#		
+4*GHSERNB#;	6000 N !	
PARAMETER G (MU_PHASE, FE:NB:CR:FE; 0)	298.15	-
42763+7*GHSERFE#+4*GHSERNB#		
+2*GHSERCR#;	6000 N !	
PARAMETER G (MU_PHASE, NB:NB:CR:FE; 0)	298.15	
+17354+5*GHSERNB#+2*GHSERCR#		
+6*GHSERFE#;	6000 N !	
PARAMETER G (MU_PHASE, CR:NB:FE:FE; 0)	298.15	+34655+GHSERCR#+4*GHSERNB#
+8*GHSERFE#;	6000 N !	
PARAMETER G (MU_PHASE, CR:NB:NB:FE; 0)	298.15	-190602+GHSERCR#

+6*GHSE_{RNB}#+6*GHSE_{RFE}# ; 6000 N !
PARAMETER G (MU_PHASE, FE:NB:CR:NB;0) 298.15
+347534+GHSE_{RFE}#+10*GHSE_{RNB}#
+2*GHSE_{RCR}#; 6000 N !
PARAMETER G (MU_PHASE, NB:NB:CR:NB;0) 298.15
+382750+11*GHSE_{RNB}#+2*GHSE_{RCR}#;
6000 N !
PARAMETER G (MU_PHASE, CR:NB:FE:NB;0) 298.15
+442921+GHSE_{RCR}#+10*GHSE_{RNB}#
+2*GHSE_{RFE}#; 6000 N !
PARAMETER G (MU_PHASE, FE:NB:FE:NB;0) 298.15 +431760+3*GHSE_{RFE}#
+10*GHSE_{RNB}#; 6000 N!
PARAMETER G (MU_PHASE, NB:NB:FE:NB;0) 298.15 +507244+2*GHSE_{RFE}#
+11*GHSE_{RNB}#; 6000 N !
PARAMETER G (MU_PHASE, CR, FE:NB:NB:CR, FE;0) 298.15 -180400-200*T;
6000 N !

PHASE FE3SN2 % 2 3 2 !
CONSTITUENT FE3SN2 :FE : SN : !

PARAMETER G (FE3SN2, FE:SN;0) 298.15 -6.02835121E+04
+3.24455137E+01*T+3*GHSE_{RFE}#+2*GHSE_{RSN}#; 6000 N !

PHASE FE5SN3_B82 % 2 5 3 !
CONSTITUENT FE5SN3_B82 :FE : SN : !

PARAMETER G (FE5SN3_B82, FE:SN;0) 298.15 -6.50170626E+04
+2.3661478E+01*T+5*GHSE_{RFE}#+3*GHSE_{RSN}#; 6000 N !

PHASE FESN2_C16 % 2 1 2 !
CONSTITUENT FESN2_C16 :FE : SN : !

PARAMETER G (FESN2_C16, FE:SN;0) 298.15 -4.75103535E+04
+3.36329828E+01*T+GHSE_{RFE}#+2*GHSE_{RSN}#; 6000 N !

PHASE FESN_B35 % 2 1 1 !
CONSTITUENT FESN_B35 :FE : SN : !

PARAMETER G (FESN_B35, FE:SN;0) 298.15 -3.49407767E+04
+2.25984950E+01*T+GHSE_{RFE}#+GHSE_{RSN}#; 6000 N !

PHASE C16 % 2 1 2 !
CONSTITUENT C16 :FE, ZR : FE, ZR : !

PARAMETER G (C16, FE:ZR;0) 298.15 -5.20495419E+04
+7.91714899*T+GHSE_{RFE}#+2*GHSE_{RZR}#; 6000 N!
PARAMETER G (C16, ZR:FE;0) 298.15 31048.9727

+GHSERZR#+2*GHSERFE#; 6000 N!
 PARAMETER G(C16,FE:FE;0) 298.15 106332.6
 +3*GHSERFE#; 6000 N!
 PARAMETER G(C16,ZR:ZR;0) 298.15 94770.38
 +3*GHSERZR#; 6000 N!
 PARAMETER G(C16,FE,ZR:ZR;0) 298.15 -9.94139318E+04; 6000 N!
 PARAMETER G(C16,FE:ZR,FE;0) 298.15 -2.18320225E+05; 6000 N!

PHASE E1a % 2 1 3 !
 CONSTITUENT E1a :FE,ZR : FE,ZR : !

PARAMETER G(E1a,FE:ZR;0) 298.15 -5.63495417E+04
 +7.37466671*T+GHSERFE+3*GHSERZR; 6000 N!
 PARAMETER G(E1a,ZR:FE;0) 298.15 198436.36
 +GHSERZR+3*GHSERFE; 6000 N!
 PARAMETER G(E1a,FE:FE;0) 298.15 160799.175
 +4*GHSERFE; 6000 N!
 PARAMETER G(E1a,ZR:ZR;0) 298.15 60768.531
 +4*GHSERZR; 6000 N!
 \$\$ PARAMETER G(E1a,FE,ZR:ZR;0) 298.15 5.34023303E+05; 6000 N!
 \$\$ PARAMETER G(E1a,FE:ZR,FE;0) 298.15 -1.39498639E+05; 6000 N!

PHASE A15 % 2 3 1 !
 CONSTITUENT A15 :NB,SN,ZR : NB,SN,ZR : !

PARAMETER G(A15,NB:NB;0) 298.15 +40513
 -1.0937822E+01*T+4*GHSEARNB#;
 6000 N!
 PARAMETER G(A15,SN:SN;0) 298.15 +30031
 +1.9454908E+01*T+4*GHSEARSN#;
 6000 N!
 PARAMETER G(A15,ZR:ZR;0) 298.15 8.35000000E+04+4*GHSERZR#;
 6000 N!
 PARAMETER G(A15,NB:SN;0) 298.15 -67413.336+12.695285*T
 +3*GHSEARNB#+GHSEARSN#; 6000 N!
 PARAMETER G(A15,SN:NB;0) 298.15 +79925
 +5.00773548E+01*T+3*GHSEARSN#
 +GHSEARNB#; 6000 N!
 PARAMETER G(A15,SN:ZR;0) 298.15 +2.01296000E+05
 +3*GHSEARSN#+GHSERZR#; 6000 N!
 PARAMETER G(A15,ZR:SN;0) 298.15 -1.42326281E+05
 -4.43634632*T+GHSEARSN#+3*GHSERZR#; 6000 N!
 PARAMETER G(A15,NB:NB,SN;0) 298.15 +77437.483-40.567*T; 6000 N!
 PARAMETER G(A15,ZR:SN,ZR;0) 298.15 -1.39382692E+05; 6000 N!
 PARAMETER G(A15,NB,ZR:SN;0) 298.15 -125000; 6000 N !
 PARAMETER G(A15,NB,ZR:SN;1) 298.15 -472000+15*T; 6000 N !
 PARAMETER G(A15,NB,ZR:SN;2) 298.15 -410000; 6000 N !

PHASE NB6SN5 % 3 24 16 4 !
 CONSTITUENT NB6SN5 :NB : SN : SN : !

PARAMETER G(NB6SN5,NB:SN:SN;0) 298.15 -5.84500E+05
+24.9325157*T+24*GHSERNB#+20*GHSERSN#; 6000 N !

PHASE NBSN2 % 2 1 2 !
CONSTITUENT NBSN2 :NB : SN : !

PARAMETER G(NBSN2,NB:SN;0) 298.15 -45536.552
+11.070455*T+GHSERNB#+2*GHSERSN#; 6000 N!

PHASE Ti2Ni % 3 1 2 3 !
CONSTITUENT Ti2Ni :FE,NB,ZR : FE : ZR : !

PARAMETER G(Ti2Ni,FE:FE:ZR;0) 298.15 -125695.7509
+3*GHSERFE#+3*GHSERZR#; 6000 N !

PARAMETER G(Ti2Ni,NB:FE:ZR;0) 298.15 -69240.15952-
1.06061520E+01
+GHSERNB#+2*GHSERFE#+3*GHSERZR#; 6000 N !
PARAMETER G(Ti2Ni,ZR:FE:ZR;0) 298.15 -83988.28431-4.50240672*T
+2*GHSERFE#+4*GHSERZR#; 6000 N !

PARAMETER G(Ti2Ni,NB,ZR:FE:ZR;0) 298.15 -1.11736263E+05; 6000 N !

PHASE N_FESNZR % 3 16 16 12 !
CONSTITUENT N_FESNZR :FE : SN : ZR : !

PARAMETER G(N_FESNZR,FE:SN:ZR;0) 298.15 -1420604-175*T
+16*GHSERFE#+16*GHSERSN#+12*GHSERZR#; 6000 N !

PHASE THETA % 3 1 2 6 !
CONSTITUENT THETA :FE : SN : ZR : !

PARAMETER G(THETA,FE:SN:ZR;0) 298.15 -377233
+1*GHSERFE#+2*GHSERSN#+6*GHSERZR#; 6000 N !

PHASE FE6SN6ZR % 3 6 6 1 !
CONSTITUENT FE6SN6ZR :FE : SN : ZR : !

PARAMETER G(FE6SN6ZR,FE:SN:ZR;0) 298.15 -170972-34*T
+6*GHSERFE#+6*GHSERSN#+1*GHSERZR#; 6000 N !

PHASE KWON % 3 3 9 20 !
CONSTITUENT KWON :FE : SN : ZR : !

PARAMETER G(KWON,FE:SN:ZR;0) 298.15 -1360910-148*T
+3*GHSERFE#+9*GHSERSN#+20*GHSERZR#; 6000 N !

PHASE XDOUBLE % 3 8 20 18 !

CONSTITUENT XDOUBLE :FE : SN : ZR : !

PARAMETER G(XDOUBLE,FE:SN:ZR;0) 298.15 -1971900-160*T
+8*GHSEFE#+20*GHSESN#+18*GHSEZR#; 6000 N !

PHASE XPRIME % 3 9 20 22 !
CONSTITUENT XPRIME :FE : SN : ZR : !

PARAMETER G(XPRIME,FE:SN:ZR;0) 298.15 -2510000
+9*GHSEFE#+20*GHSESN#+22*GHSEZR#; 6000 N !

PHASE Y_FESNZR % 3 18 9 5 !
CONSTITUENT Y_FESNZR :FE : SN : ZR : !

PARAMETER G(Y_FESNZR,FE:SN:ZR;0) 298.15 -745000
+18*GHSEFE#+9*GHSESN#+5*GHSEZR#; 6000 N !

LIST_OF_REFERENCES

NUMBER SOURCE

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