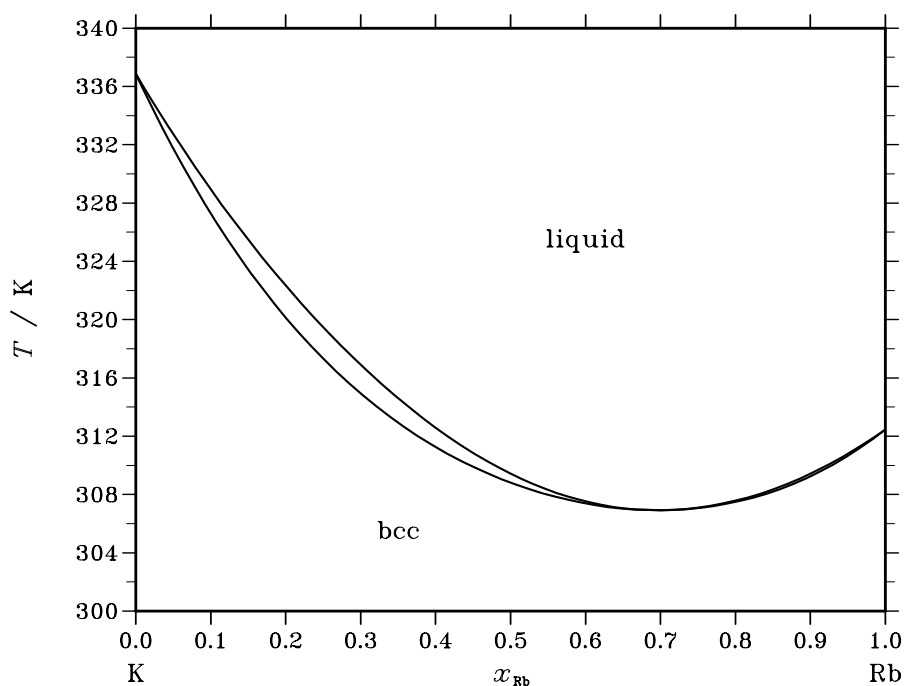


K – Rb (Potassium – Rubidium)**Fig. 1.** Calculated phase diagram for the system K-Rb.

The phase diagram for the K-Rb system is very simple showing complete mixing between the pure elements in the liquid and the bcc phases with a minimum in the solidus/liquidus surface at about 307 K. The dataset adopted by SGTE was derived by Potter and Rand [85Pot] and is in good agreement with the experimental data for the system. The phase diagram has been studied by Goates *et al.* [71Goa], Kurnakov and Nikitinskii [14Kur], Rinck [36Rin] and Böhm and Klemm [39Böh]. Thermodynamic properties in the liquid phase were measured by Yokokawa and Kleppa [64Yok] with a reaction calorimeter and the assessment was based on these data coupled to the experimental phase diagram information. The system has also been reviewed by Bale and Pelton [83Bal].

Table I. Phases, structures and models.

Phase	Strukturbericht	Prototype	Pearson symbol	Space group	SGTE name	Model
liquid					LIQUID	(K,Rb) ₁
bcc	A2	W	cI2	$Im\bar{3}m$	BCC_A2	(K,Rb) ₁

Table II. Invariant reactions.

Reaction	Type	T / K	Compositions / x_{Rb}		$\Delta_r H / (\text{J/mol})$
liquid \rightleftharpoons bcc	congruent	306.9	0.697	0.697	–2307

Table IIIa. Integral quantities for the liquid phase at 384 K.

x_{Rb}	ΔG_{m} [J/mol]	ΔH_{m} [J/mol]	ΔS_{m} [J/(mol·K)]	G_{m}^{E} [J/mol]	S_{m}^{E} [J/(mol·K)]	ΔC_P [J/(mol·K)]
0.000	0	0	0.000	0	0.000	0.000
0.100	−836	46	2.298	202	−0.405	0.000
0.200	−1239	82	3.440	359	−0.720	0.000
0.300	−1480	108	4.134	471	−0.945	0.000
0.400	−1611	123	4.515	538	−1.080	0.000
0.500	−1653	128	4.638	560	−1.125	0.000
0.600	−1611	123	4.515	538	−1.080	0.000
0.700	−1480	108	4.134	471	−0.945	0.000
0.800	−1239	82	3.440	359	−0.720	0.000
0.900	−836	46	2.298	202	−0.405	0.000
1.000	0	0	0.000	0	0.000	0.000

Reference states: K(liquid), Rb(liquid)

Table IIIb. Partial quantities for K in the liquid phase at 384 K.

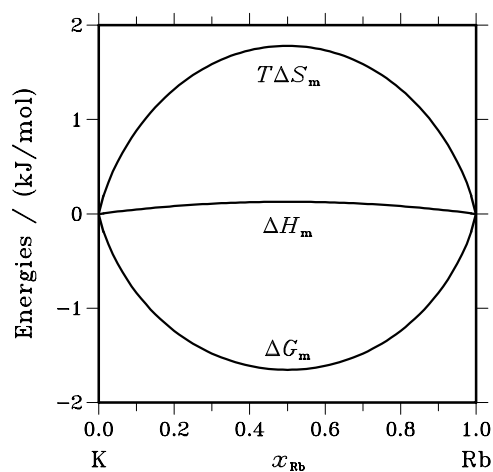
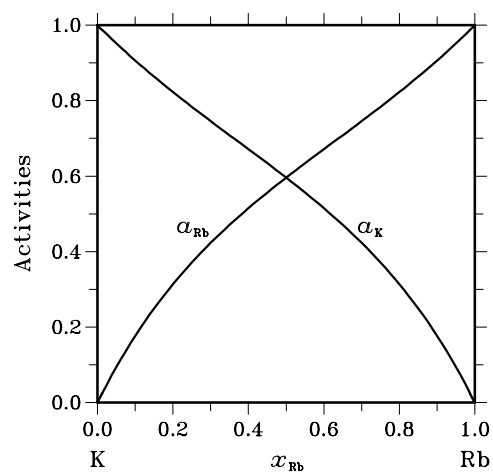
x_{K}	ΔG_{K} [J/mol]	ΔH_{K} [J/mol]	ΔS_{K} [J/(mol·K)]	G_{K}^{E} [J/mol]	S_{K}^{E} [J/(mol·K)]	a_{K}	γ_{K}
1.000	0	0	0.000	0	0.000	1.000	1.000
0.900	−314	5	0.831	22	−0.045	0.906	1.007
0.800	−623	20	1.675	90	−0.180	0.823	1.028
0.700	−937	46	2.560	202	−0.405	0.746	1.065
0.600	−1272	82	3.527	359	−0.720	0.671	1.119
0.500	−1653	128	4.638	560	−1.125	0.596	1.192
0.400	−2119	184	5.998	807	−1.620	0.515	1.287
0.300	−2746	251	7.805	1098	−2.206	0.423	1.410
0.200	−3704	328	10.501	1434	−2.881	0.313	1.567
0.100	−5536	415	15.499	1815	−3.646	0.177	1.766
0.000	−∞	512	∞	2241	−4.501	0.000	2.018

Reference state: K(liquid)

Table IIIc. Partial quantities for Rb in the liquid phase at 384 K.

x_{Rb}	ΔG_{Rb} [J/mol]	ΔH_{Rb} [J/mol]	ΔS_{Rb} [J/(mol·K)]	G_{Rb}^{E} [J/mol]	S_{Rb}^{E} [J/(mol·K)]	a_{Rb}	γ_{Rb}
0.000	−∞	512	∞	2241	−4.501	0.000	2.018
0.100	−5536	415	15.499	1815	−3.646	0.177	1.766
0.200	−3704	328	10.501	1434	−2.881	0.313	1.567
0.300	−2746	251	7.805	1098	−2.206	0.423	1.410
0.400	−2119	184	5.998	807	−1.620	0.515	1.287
0.500	−1653	128	4.638	560	−1.125	0.596	1.192
0.600	−1272	82	3.527	359	−0.720	0.671	1.119
0.700	−937	46	2.560	202	−0.405	0.746	1.065
0.800	−623	20	1.675	90	−0.180	0.823	1.028
0.900	−314	5	0.831	22	−0.045	0.906	1.007
1.000	0	0	0.000	0	0.000	1.000	1.000

Reference state: Rb(liquid)

**Fig. 2.** Integral quantities of the liquid phase at $T=384$ K.**Fig. 3.** Activities in the liquid phase at $T=384$ K.**Table IVa.** Integral quantities for the stable phases at 298 K.

Phase	x_{Rb}	ΔG_{m} [J/mol]	ΔH_{m} [J/mol]	ΔS_{m} [J/(mol·K)]	G_{m}^{E} [J/mol]	S_{m}^{E} [J/(mol·K)]	ΔC_P [J/(mol·K)]
bcc	0.000	0	0	0.000	0	0.000	0.000
	0.100	-602	15	2.071	203	-0.632	0.000
	0.200	-879	26	3.038	361	-1.123	0.000
	0.300	-1040	35	3.605	474	-1.474	0.000
	0.400	-1126	39	3.912	541	-1.684	0.000
	0.500	-1154	41	4.009	564	-1.754	0.000
	0.600	-1126	39	3.912	541	-1.684	0.000
	0.700	-1040	35	3.605	474	-1.474	0.000
	0.800	-879	26	3.038	361	-1.123	0.000
	0.900	-602	15	2.071	203	-0.632	0.000
	1.000	0	0	0.000	0	0.000	0.000

Reference states: K(bcc), Rb(bcc)

Table IVb. Partial quantities for K in the stable phases at 298 K.

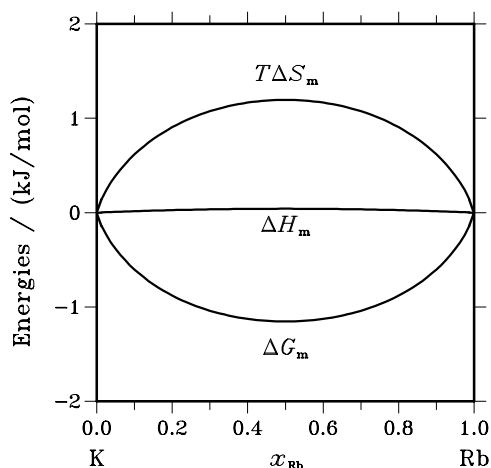
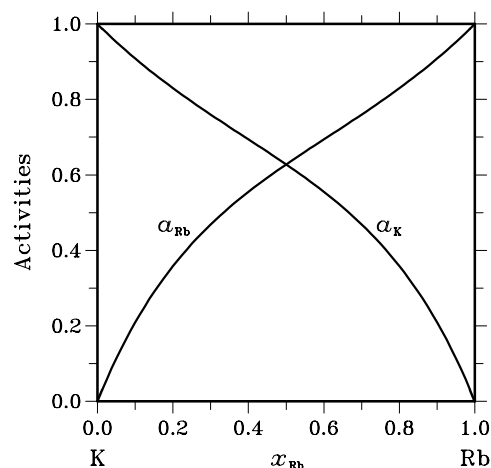
Phase	x_{K}	ΔG_{K} [J/mol]	ΔH_{K} [J/mol]	ΔS_{K} [J/(mol·K)]	G_{K}^{E} [J/mol]	S_{K}^{E} [J/(mol·K)]	a_{K}	γ_{K}
bcc	1.000	0	0	0.000	0	0.000	1.000	1.000
	0.900	-238	2	0.806	23	-0.070	0.908	1.009
	0.800	-463	7	1.575	90	-0.281	0.830	1.037
	0.700	-681	15	2.334	203	-0.632	0.760	1.085
	0.600	-905	26	3.124	361	-1.123	0.694	1.157
	0.500	-1154	41	4.009	564	-1.754	0.628	1.256
	0.400	-1458	59	5.092	812	-2.526	0.555	1.388
	0.300	-1878	81	6.572	1105	-3.439	0.469	1.562
	0.200	-2544	105	8.890	1444	-4.491	0.358	1.791
	0.100	-3878	133	13.460	1827	-5.684	0.209	2.091
	0.000	$-\infty$	164	∞	2256	-7.018	0.000	2.485

Reference state: K(bcc)

Table IVc. Partial quantities for Rb in the stable phases at 298 K.

Phase	x_{Rb}	ΔG_{Rb} [J/mol]	ΔH_{Rb} [J/mol]	ΔS_{Rb} [J/(mol·K)]	G_{Rb}^{E} [J/mol]	S_{Rb}^{E} [J/(mol·K)]	a_{Rb}	γ_{Rb}
bcc	0.000	$-\infty$	164	∞	2256	−7.018	0.000	2.485
	0.100	−3878	133	13.460	1827	−5.684	0.209	2.091
	0.200	−2544	105	8.890	1444	−4.491	0.358	1.791
	0.300	−1878	81	6.572	1105	−3.439	0.469	1.562
	0.400	−1458	59	5.092	812	−2.526	0.555	1.388
	0.500	−1154	41	4.009	564	−1.754	0.628	1.256
	0.600	−905	26	3.124	361	−1.123	0.694	1.157
	0.700	−681	15	2.334	203	−0.632	0.760	1.085
	0.800	−463	7	1.575	90	−0.281	0.830	1.037
	0.900	−238	2	0.806	23	−0.070	0.908	1.009
	1.000	0	0	0.000	0	0.000	1.000	1.000

Reference state: Rb(bcc)

**Fig. 4.** Integral quantities of the stable phases at $T=298$ K.**Fig. 5.** Activities in the stable phases at $T=298$ K.**References**

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