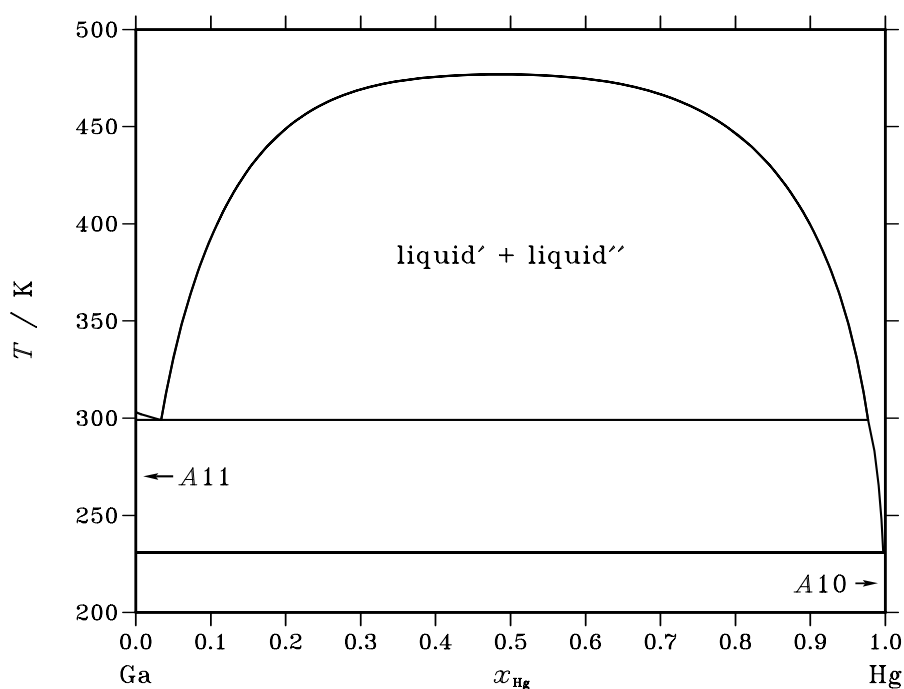


**Ga – Hg** (Gallium – Mercury)**Fig. 1.** Calculated phase diagram for the system Ga-Hg.

Although Ga and Hg are among the most easily melting metals, their miscibility in the liquid as well as in the solid state is limited and complete solubility is only observed above 476.7 K. The thermodynamic assessment which has been selected is from an unpublished work of Ansara [91Ans]. The experimental work has been reviewed by Guminski and Zabdyr [93Gum] and is well reproduced by calculation. The liquidus is in agreement with most of the published data, particularly those from Predel [60Pre] and Gubbels [90Gub]. The calculated enthalpy of mixing agrees with the experimental values from Marco *et al.* [75Mar], Gaune-Escard and Bros [79Gau] and is slightly more positive than the data from Predel *et al.* [67Pre].

**Table I.** Phases, structures and models.

Phase	Struktur-bericht	Prototype	Pearson symbol	Space group	SGTE name	Model
liquid					LIQUID	(Ga,Hg) <sub>1</sub>
A11	A11	$\alpha$ Ga	<i>oC8</i>	<i>Cmca</i>	ORTHORHOMBIC_CMCA	Ga <sub>1</sub>
A10	A10	$\alpha$ Hg	<i>hR1</i>	<i>R<math>\bar{3}m</math></i>	RHOMBOHEDRAL_A10	Hg <sub>1</sub>

**Table II.** Invariant reactions.

Reaction	Type	<i>T</i> / K	Compositions / <i>x</i> <sub>Hg</sub>				$\Delta_r H$ / (J/mol)
liquid $\rightleftharpoons$ liquid' + liquid''	critical	477.0	0.487	0.487	0.487		0
liquid' $\rightleftharpoons$ A11 + liquid''	monotectic	299.1	0.034	0.000	0.977		–5617
liquid'' $\rightleftharpoons$ A11 + A10	eutectic	230.8	0.997	0.000	0.997		–2332

**Table IIIa.** Integral quantities for the liquid phase at 600 K.

$x_{\text{Hg}}$	$\Delta G_{\text{m}}$ [J/mol]	$\Delta H_{\text{m}}$ [J/mol]	$\Delta S_{\text{m}}$ [J/(mol·K)]	$G_{\text{m}}^{\text{E}}$ [J/mol]	$S_{\text{m}}^{\text{E}}$ [J/(mol·K)]	$\Delta C_P$ [J/(mol·K)]
0.000	0	0	0.000	0	0.000	0.000
0.100	−667	642	2.181	955	−0.522	0.000
0.200	−872	1128	3.333	1625	−0.828	0.000
0.300	−988	1487	4.125	2059	−0.954	0.000
0.400	−1065	1733	4.663	2293	−0.933	0.000
0.500	−1110	1869	4.965	2347	−0.798	0.000
0.600	−1124	1881	5.009	2233	−0.587	0.000
0.700	−1097	1746	4.737	1951	−0.342	0.000
0.800	−1003	1424	4.044	1494	−0.117	0.000
0.900	−773	863	2.727	849	0.024	0.000
1.000	0	0	0.000	0	0.000	0.000

Reference states: Ga(liquid), Hg(liquid)

**Table IIIb.** Partial quantities for Ga in the liquid phase at 600 K.

$x_{\text{Ga}}$	$\Delta G_{\text{Ga}}$ [J/mol]	$\Delta H_{\text{Ga}}$ [J/mol]	$\Delta S_{\text{Ga}}$ [J/(mol·K)]	$G_{\text{Ga}}^{\text{E}}$ [J/mol]	$S_{\text{Ga}}^{\text{E}}$ [J/(mol·K)]	$a_{\text{Ga}}$	$\gamma_{\text{Ga}}$
1.000	0	0	0.000	0	0.000	1.000	1.000
0.900	−374	84	0.762	152	−0.114	0.928	1.031
0.800	−579	290	1.449	534	−0.407	0.890	1.113
0.700	−709	583	2.153	1071	−0.812	0.868	1.239
0.600	−822	966	2.980	1727	−1.267	0.848	1.414
0.500	−957	1484	4.067	2501	−1.696	0.826	1.651
0.400	−1151	2219	5.616	3420	−2.002	0.794	1.985
0.300	−1479	3294	7.956	4527	−2.055	0.743	2.478
0.200	−2148	4874	11.705	5881	−1.677	0.650	3.250
0.100	−3944	7162	18.511	7543	−0.634	0.454	4.536
0.000	−∞	10401	∞	9575	1.378	0.000	6.816

Reference state: Ga(liquid)

**Table IIIc.** Partial quantities for Hg in the liquid phase at 600 K.

$x_{\text{Hg}}$	$\Delta G_{\text{Hg}}$ [J/mol]	$\Delta H_{\text{Hg}}$ [J/mol]	$\Delta S_{\text{Hg}}$ [J/(mol·K)]	$G_{\text{Hg}}^{\text{E}}$ [J/mol]	$S_{\text{Hg}}^{\text{E}}$ [J/(mol·K)]	$a_{\text{Hg}}$	$\gamma_{\text{Hg}}$
0.000	−∞	7322	∞	11176	−6.422	0.000	9.395
0.100	−3308	5666	14.955	8179	−4.189	0.515	5.153
0.200	−2042	4480	10.870	5987	−2.511	0.664	3.320
0.300	−1640	3596	8.727	4366	−1.283	0.720	2.399
0.400	−1429	2884	7.188	3142	−0.431	0.751	1.877
0.500	−1264	2254	5.863	2194	0.100	0.776	1.552
0.600	−1106	1656	4.604	1442	0.357	0.801	1.335
0.700	−933	1082	3.358	847	0.392	0.829	1.185
0.800	−716	561	2.129	397	0.273	0.866	1.083
0.900	−420	164	0.973	105	0.097	0.919	1.021
1.000	0	0	0.000	0	0.000	1.000	1.000

Reference state: Hg(liquid)

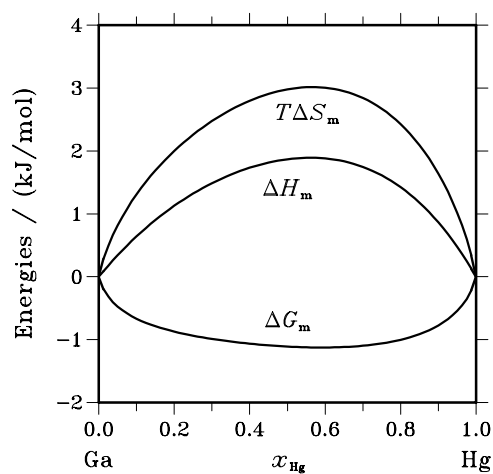


Fig. 2. Integral quantities of the liquid phase at  $T=600$  K.

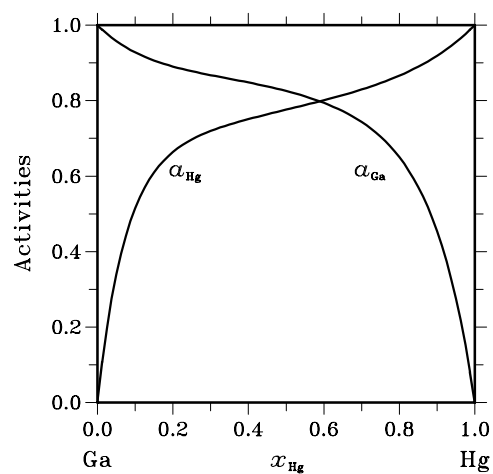


Fig. 3. Activities in the liquid phase at  $T=600$  K.

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