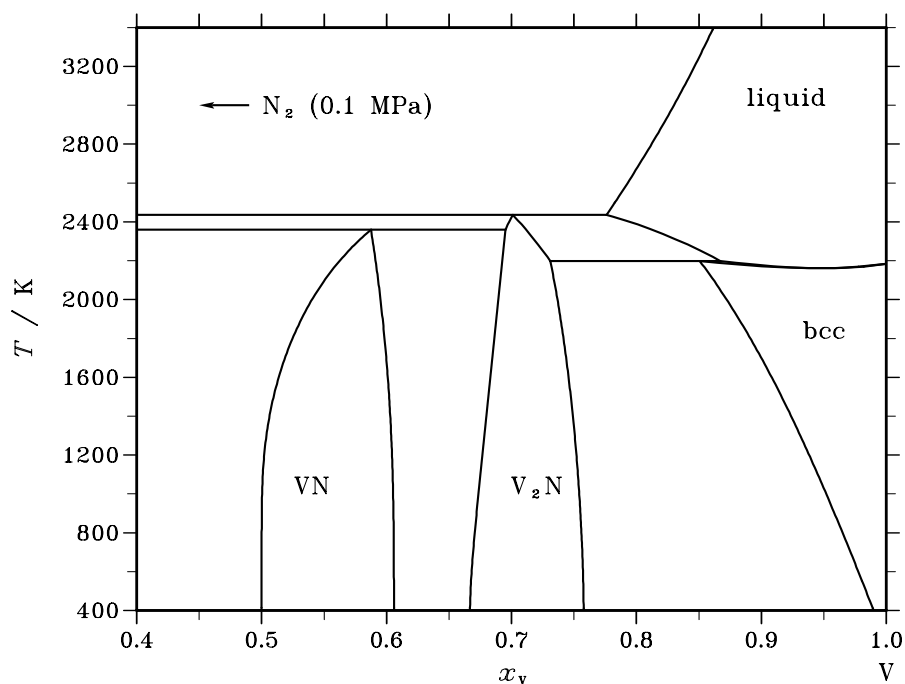


N – V (Nitrogen – Vanadium)**Fig. 1.** Calculated phase diagram for the system N-V.

N and V are both alloying elements in steels and other alloys. V is a strong carbide and nitride former and this is used for hardening together with other carbide/nitride formers. The solubility of N in V is rather high and in addition there are a hexagonal and a cubic nitride. The assessment of the N-V system has been reported by [91Oht].

Table I. Phases, structures and models.

Phase	Struktur-bericht	Prototype	Pearson symbol	Space group	SGTE name	Model
liquid					LIQUID	(N,V) ₁
VN	B1	NaCl	cF8	$Fm\bar{3}m$	FCC_A1	V ₁ (N,□) ₁
V ₂ N	hP9	$P\bar{3}1m$	HCP_A3	V ₂ (N,□) ₁
bcc	A2	W	cI2	$Im\bar{3}m$	BCC_A2	V ₁ (N,□) ₃

Table II. Invariant reactions.

Reaction	Type	T / K	Compositions / x_V			$\Delta_r H$ / (J/mol)
gas + liquid \rightleftharpoons V ₂ N	gas-peritectic	2435.6	0.000	0.776	0.701	−70097
gas + V ₂ N \rightleftharpoons VN	gas-peritectoid	2359.1	0.000	0.695	0.588	−29506
V ₂ N + liquid \rightleftharpoons bcc	peritectic	2198.5	0.731	0.867	0.851	−23669
liquid \rightleftharpoons bcc	congruent	2161.0	0.949	0.949		−24420

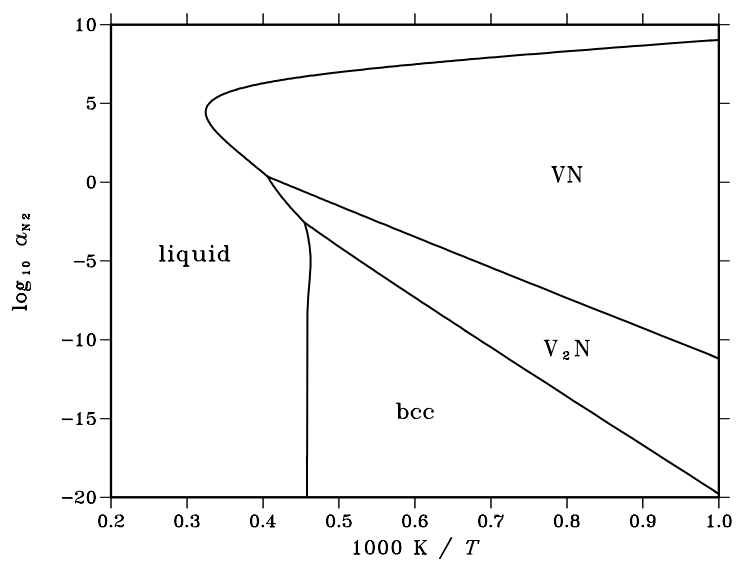


Fig. 2. Calculated temperature-activity phase diagram. Reference state: $\frac{1}{2}\text{N}_2(\text{gas}, 0.1 \text{ MPa})$.

References

[91Oht] H. Ohtani, M. Hillert: Calphad **15** (1991) 11–24.