

C-V (Carbon-Vanadium)

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The V-C phase diagram in [Massalski2] was updated by [1991Oka] based on the thermodynamic assessment reported by [1991Hua]. This system was assessed by [1991Lee] also. Since then, new experimental phase boundary data were reported by [1998Wie] and [1999Lip].

[2006Hu] re-assessed the V-C system based on these new data as well as the old experimental data published before 1991. The result is shown in Fig. 1.

V-C crystal structure data are given in Table 1.

References

- 1991Hua:** W. Huang, An Assessment of the V-C System, *Z. Metallkd.*, 1991, **82**, p 174-181
1991Lee: B. Lee and D.N. Lee, A Thermodynamic Study on the V-C and Fe-V Systems, *CALPHAD*, 1991, **15**(3), p 283-291
1991Oka: H. Okamoto, C-V (Carbon-Vanadium), *J. Phase Equilibria*, 1991, **12**(6), p 699

Table 1 V-C crystal structure data

Phase	Composition, at.% C	Pearson symbol	Space group	Strukturbericht designation	Prototype
(V)	0-3.8	<i>cI2</i>	<i>Im</i> $\bar{3}m$	<i>A2</i>	W
V ₂ C	29.3-33.3	<i>oP12</i>	<i>Pbcn</i>	...	...
		<i>hP3</i>	<i>P6₃/mmc</i>	<i>L'3</i>	Fe ₂ N
		<i>hP9</i>	<i>P</i> $\bar{3}1m$	...	...
V ₄ C _{3-x}	38	<i>hR20</i>	<i>R</i> $\bar{3}m$	...	...
VC	37.1-47	<i>cF8</i>	<i>Fm</i> $\bar{3}m$	<i>B1</i>	NaCl
V ₆ C ₅	42-44	<i>mB44</i>	<i>B2</i>	...	...
V ₈ C ₇	46.7	<i>cP60</i>	<i>P4₁32</i>	...	...
		<i>cP60</i>	<i>P4₃32</i>	...	...
(C)	100	<i>hP4</i>	<i>P6₃/mmc</i>	<i>A9</i>	C (graphite)

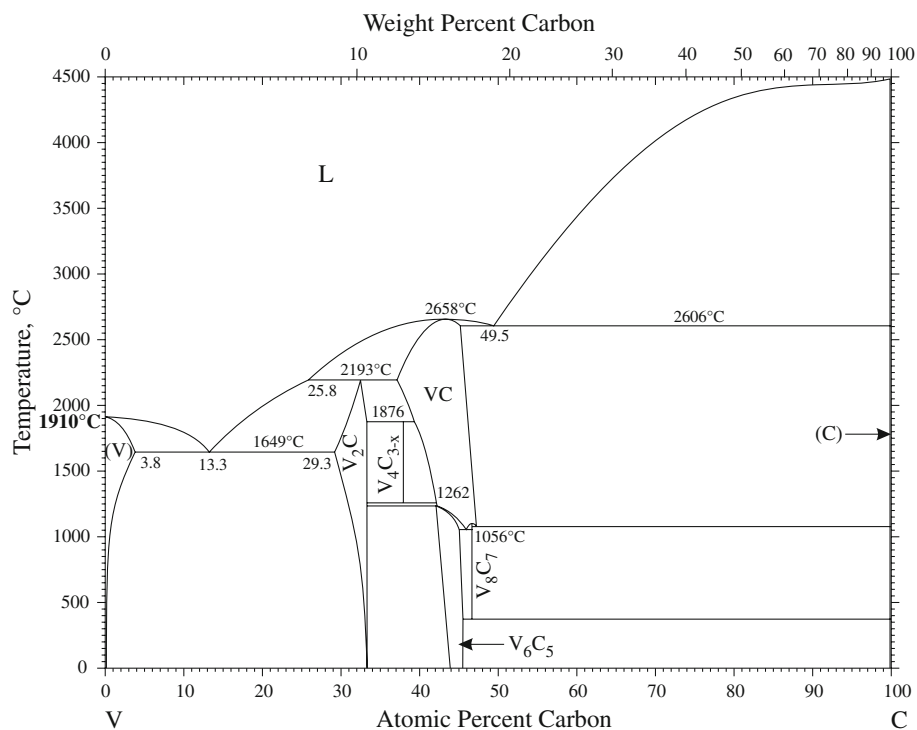


Fig. 1 C-V phase diagram

Section III: Supplemental Literature Review

1998Wie: H. Wiesenberger, W. Lengauer, and P. Ettmayer, Reactive Diffusion and Phase Equilibria in the V-C, Nb-C, Ta-C, and Ta-N Systems, *Acta Mater.*, 1998, **46**(2), p 651-666

1999Lip: V. Lipatnikov, A.I. Gusev, P. Ettmayer, and W. Lengauer, Phase Transformations in Non-stoichiometric

Vanadium Carbide, *J. Phys. Condens. Mater.*, 1999, **11**, p 164-184

2006Hu: J. Hu, C. Li, F. Wang, and W. Zhang, Thermodynamic Re-assessment of the V-C System, *J. Alloys Compd.*, 2006, **421**, p 120-127