

where D is in g/cm^3 and T in $^\circ\text{K}$. The liquid densities at the melting and normal boiling points are as follows:

	Fe	Ni
$D_{\text{m.p.}}$ (g/cm^3)	7.015	7.905
m.p., ($^\circ\text{K}$)	1805°	1728°
$D_{\text{b.p.}}$ (g/cm^3)	5.828	6.304
b.p., ($^\circ\text{K}$)	3160°	3110°

The equation of the rectilinear diameter, in the same units, are as follows:

$$D_{\phi}^{\text{Fe}} = 4.309 - 4.42 \times 10^{-4} T$$

and

$$D_{\phi}^{\text{Ni}} = 4.954 - 5.795 \times 10^{-4} T$$

The liquid range diagrams of the two metals were constructed and that of iron is given in Fig. 1. The critical temperatures of Fe, estimated at 6750°K , and of Ni,

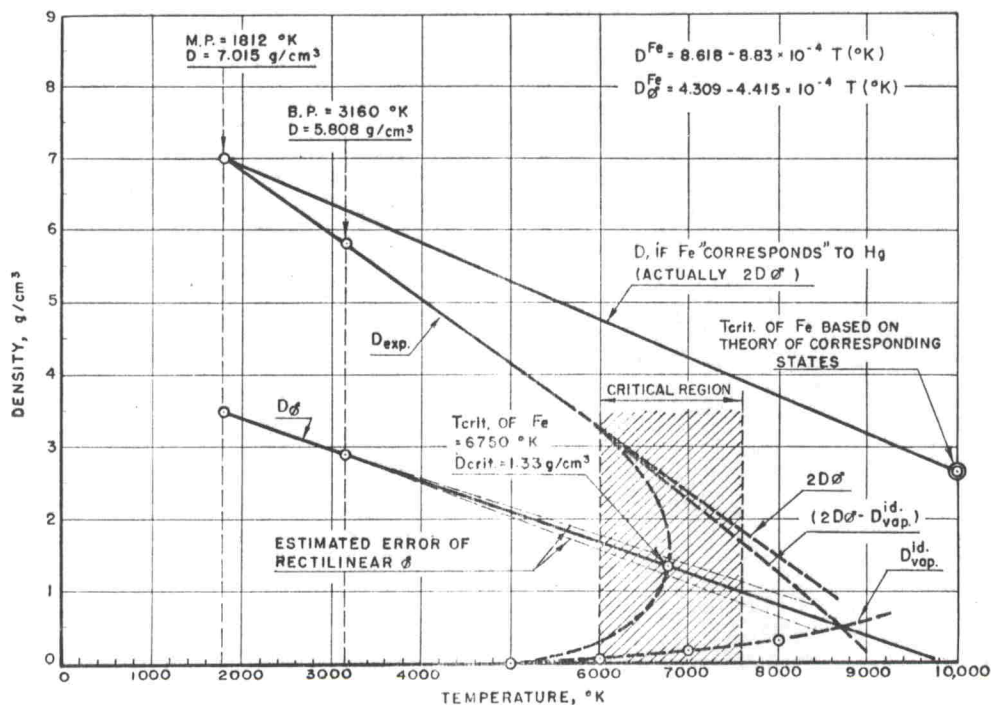


FIG. 1.

estimated at 6000°K , were based on the ratio of $D_{\text{b.p.}}/D_{\text{crit.p.}} \simeq 4.35$, since this ratio is based on the liquid range diagram of many other metals⁽⁹⁾, i.e. Hg, Bi, Ag, Pb, Sn and Ga. However, if we base our estimates of critical temperatures on the law of corresponding states and the following reliable heats and entropies of vaporization⁽¹⁰⁾ of iron and nickel:

⁽⁹⁾ P. J. MCGONIGAL, A. D. KIRSHENBAUM and A. V. GROSSE, *J. Phys. Chem.*, **66**, 737 (1962).