

Here it should be noted that CODEGONE⁽⁷⁾ shows, in complete disagreement with this work, mercury to follow closely the van der Waals liquids (see *loc. cit.*,⁽⁷⁾ p. 50 his Fig. 1); he shows $(\text{Hg})_{\text{liq.}}$ (identified as $\Gamma\text{-O}$) to have at $T_{\text{red.}} \simeq 0.36$ a $\eta_{\text{red.}} \simeq 27$. Our Table 1a and Fig. 1 show that $\eta_{\text{red.}} = 2.05$ at $T_{\text{red.}} = 0.36$, i.e., is 13x smaller than CODEGONE's value. Similarly, in his Fig. 4 (*loc. cit.*, p. 50) he shows $\nu_{\text{red.}}$ of liquid mercury to equal 10 at $T_{\text{red.}} \simeq 0.40$, not far from the curve of van der Waals liquids,

TABLE 5b.—REDUCED KINEMATIC VISCOSITY OF WATER, $\nu_{\text{liq.}}^{\text{red.}}$, AND SATURATED STEAM, $\nu_{\text{sat. vap.}}^{\text{red.}}$

t (°C)	$T_{\text{red.}}$	$\nu_{\text{liq.}}^{\text{red.}}$	$\nu_{\text{sat. vap.}}^{\text{red.}}$
-9.30	0.407 ₇	20.110	
0 = m.p.	0.422 ₁	14.110	
20	0.453 ₀	7.904	
40	0.483 ₈	5.183	
60	0.514 ₇	3.747	
80	0.545 ₆	2.883	
100	0.5765	2.325	
150	0.6538	1.5906	46.378
200	0.7310	1.2598	17.402
250	0.8083	1.078 ₇	7.850 ₄
300	0.8855	1.007 ₉	3.929 ₁
320	0.916 ₄	1.007 ₉	2.984 ₃
340	0.947 ₃	1.0000	2.2520
360	0.978 ₂	1.0000	1.6380
370	0.9937	1.0000	1.2913
374.15 = c.p.	1.000	1.0000	1.0000

TABLE 6.—ABSOLUTE VALUES OF CRITICAL VISCOSITIES AND CRITICAL TEMPERATURES

	Hg	Na	K	Ar	H ₂ O
$T_{\text{crit.}}$ °C	1460°	2530°	2180°	-122.46°	374.15°
°K	1733°	2800°	2450°	150.69°	647.31°
$\eta_{\text{crit.}}$ (mP)	4.25	0.69	0.52	0.40	0.413
$\nu_{\text{crit.}}$ (mS)	0.841	3.94	3.06	0.753	1.270

whereas in our Fig. 2, $\nu_{\text{red.}} = 0.58$ @ $T_{\text{red.}} = 0.40$, i.e., has a 17x smaller value!

More drastic are the differences in *reduced kinematic viscosities* as can be seen in Fig. 2; the $\nu_{\text{red.}}$ of all three metallic liquids decrease below the critical viscosity for most of the liquid range and only rise above the critical viscosity in the vicinity of the melting points. In contrast, the liquid argon curves dips for only a few degrees below the critical temperature and then rises abruptly like the curve for liquid water.

A few words regarding *fluidity*, ϕ , may be in order; it is defined as $\phi = 1/\eta$ (and measured in reciprocal poises or rhes) and reduced fluidity, $\phi_{\text{red.}} = 1/\eta_{\text{red.}}$. A plot of $\phi_{\text{red.}}$ v. $T_{\text{red.}}$ on a logarithmic plot is a *mirror image* reflected by a plane through the $\eta_{\text{crit.}}$ line of the curve of $\eta_{\text{red.}}$ v. $T_{\text{red.}}$ (since $\log \phi = -\log \eta$) and does not disclose any new relationships not disclosed in Fig. 1.

The saturated vapours of metals, as Fig. 2 shows, have $\nu_{\text{red.}}$ very close to the $\nu_{\text{red.}}$

IC (ABSOLUTE)
ON

$\eta_{\text{sat. vap.}}^{\text{red.}}$
0.27₀
0.30₀
0.31₈
0.35₀
0.40₀
0.48₀
0.60₀
0.75₀
1.000

IC VISCOSITY

$\eta_{\text{sat. vap.}}^{\text{red.}}$
—
19.92
9.39
5.67
3.67
2.43
1.78
1.35

-000

VISCOSITY OF WATER,
 $\eta_{\text{sat. vap.}}^{\text{red.}}$

$\eta_{\text{liq.}}^{\text{red.}}$ $\eta_{\text{sat. vap.}}^{\text{red.}}$

1.71
3.39
4.26
6.1₅
8.5₂
11.7₄
16.1₁
21.5₂
28.5₁₀
37.5₉₁
49.5₆₄
64.5₄₀
83.5₀₀₀
0.370₅
0.428₆
0.491₅
0.569₀
0.605₃
0.658₆
0.736₁
0.808₇
1.0000