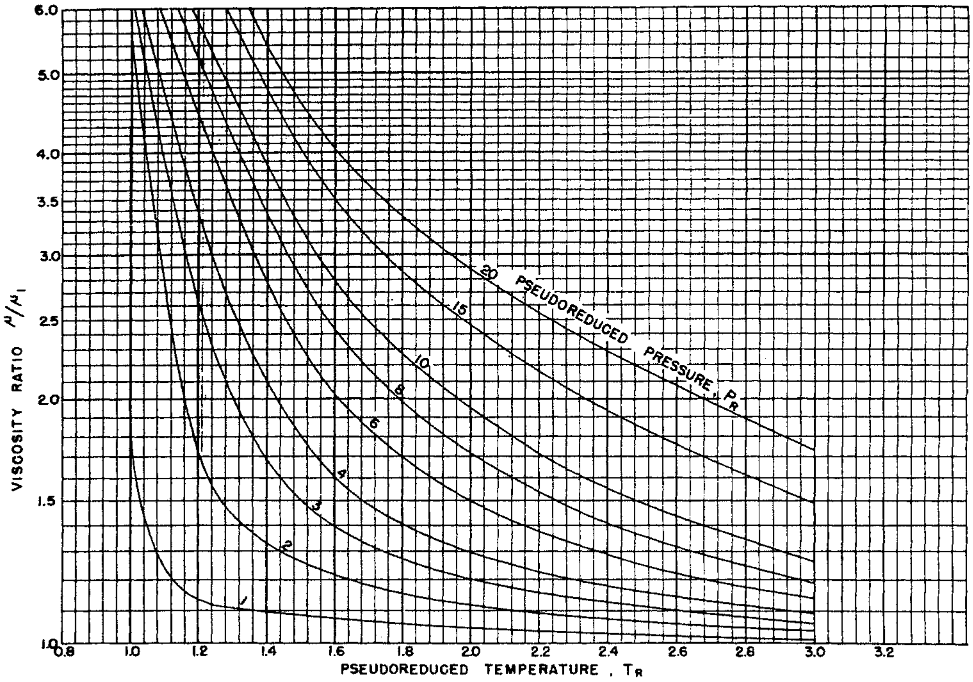

Fig. 4-102. Correlation of viscosity ratio with reduced temperature. (*Carr*, 4-106. *Courtesy AIME.*)

Table 4-23. References for Experimental Viscosity Data on Gases at High Pressure

Gas	Investigator	Method used	Reference
Nitrogen	Boyd	Capillary	4-102
	Michels and Gibson*	Capillary	4-117
Carbon dioxide	Phillips*	Capillary	4-122
	Stakelbeck*	Falling body	4-131
	Schroer and Becker	Falling body	4-129
	Naldrett and Maass	Oscillating disk	4-118
	Comings, Mayland, and Egly*	Capillary	4-108
Methane	Sage and Lacey	Rolling ball	4-127
	Bicher and Katz	Rolling ball	4-100
	Comings, Mayland, and Egly*	Capillary	4-108
	Carr*	Capillary	4-105
Ethylene	Mason and Maass	Oscillating disk	4-116
	Comings, Mayland, and Egly*	Capillary	4-108
Ethane	Smith and Brown	Rolling ball	4-130
Propane	Sage and Lacey	Rolling ball	4-128
	Smith and Brown	Rolling ball	4-130
	Bicher and Katz	Rolling ball	4-100
	Comings, Mayland, and Egly*	Capillary	4-108
Isobutane	Sage, Yale, and Lacey	Rolling ball	4-126
n-Butane	Sage, Yale, and Lacey	Rolling ball	4-126
Methane-propane	Bicher and Katz	Rolling ball	4-100
Natural gas	Sage and Lacey	Rolling ball	4-127
High-nitrogen-content natural gas	Carr*	Capillary	4-105
Low-ethane-content natural gas	Carr*	Capillary	4-105
High-ethane-content natural gas	Carr*	Capillary	4-105

* Data used in generalized correlation (Figs. 4-102, 4-103).

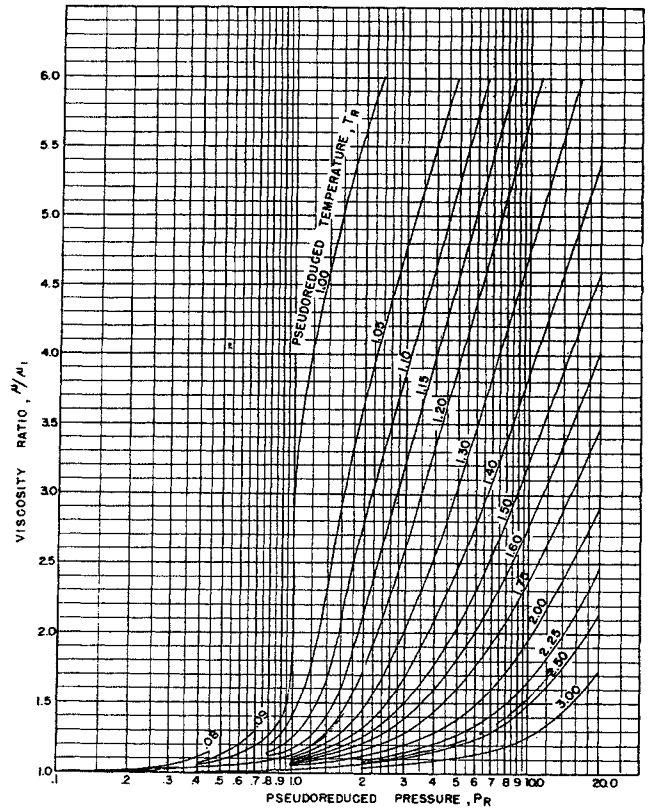

Fig. 4-103. Correlation of viscosity ratio with reduced pressure. (*Carr, Kobayashi, and Burrows*, 4-106. *Courtesy AIME.*)