TABLE A-10—CONVERSION FACTORS USEFUL IN PHASE BEHAVIOR (from Ref. 3)

To Convert From	To	Multiply By		Inverse	
Area					
acre (acre)	square meter (m^2)*	4.046 856	E + 03	2.471 054	E – 04
	square foot (ft^2)	4.356 000**	E + 04	2.295 684	E – 05
darcy (darcy)	square meter (m^2)*	9.869 23	E – 13	1.013 25	E + 12
	square centimeter (cm^2)	9.869 23	E – 09	1.013 25	E + 08
	square micrometer (μm^2)	9.869 23	E – 01	1.013 25	E + 00
	millidarcy (md)	1.000 000**	E + 0 3	1.000 000**	E – 03
	cm^2-cp · sec^{-1} · atm^{-1}	1.000 000**	E + 00	1.000 000**	E + 00
square foot (ft^2)	square meter ($m^{2)*}$	9.290 304**	E – 02	1.076 391	E + 01
	square centimeter (cm^2)	9.290 304**	E + 02	1.076 391	E – 03
	square inch ($in.^2$)	1.440 000**	E + 02	6.944 444	E – 03
hectare (ha)	square meter (m^2)*	1.000 000**	E + 04	1.000 000**	E – 04
	acre	2.471 054	E + 00	4.046 856	E – 01
square mile (sq mile)	square meter (m^2)*	2.589 988	E + 06	3.861 022	E – 07
	acre	6.400 000**	E + 02	1.562 500**	E – 03
Density					
gram per cubic centimeter (g/cm^3)	kilogram/cubic meter (kg/m^3)*	1.000 000**	E + 03	1.000 000**	E – 03
	pound-mass/cubic foot (lbm/ft^3)	6.242 797	E + 01	1.601 846	E – 02
	pound-mass/gallon (lbm/gal)	8.345 405	E + 00	1.198 264	E – 01
	pound-mass/barrel (lbm/bbl)	3.505 070	E + 02	2.853 010	E – 03
pound-mass per cubic foot (lbm/ft^3)	kilogram/cubic meter (kg/m^3)*	1.601 846	E + 01	6.242 797	E – 02
	pound-mass/gallon (lbm/gal)	1.336 805	E – 01	7.480 520	E + 00
	pound-mass/barrel (lbm/bbl)	5.614 583	E + 00	1.781 076	E – 01
pound-mass per gallon (lbm/gal)	kilogram/cubic meter (kg/m^3)*	1.198 264	E + 02	8.345 406	E – 03
	pound-mass/barrel (lbm/bbl)	4.200 000	E + 01	2.380 952	E – 02
Force					
dyne (dyne)	newton (N)*	1.000 000**	E – 05	1.000 000**	E + 05
	pound-force (lbf)	2.248 089	E – 06	4.448 222	E + 05
kilogram-force (kgf)	newton (N)*	9.806 650**	E + 00	1.019 716	E – 01
	pound-force (lbf)	2.204 622	E + 00	4.535 924	E – 01
pound-force (lbf)	newton (N)*	4.448 222	E + 00	2.248 089	E – 01
Length					
angstrom (Å)	meter (m)*	1.000 000**	E – 10	1.000 000**	E + 10
centimeter (cm)	meter (m)*	1.000 000**	E – 02	1.000 000**	E + 02
foot (ft)	meter (m)*	3.048 000**	E – 01	3.280 840	E + 00
	centimeter (cm)	3.048 000**	E + 01	3.280 840	E – 02
inch (in.)	meter (m)*	2.540 000**	E – 02	3.937 008	E + 01
	centimeter (cm)	2.540 000**	E + 00	3.937 008	E – 01
micron (μm)	meter (m)*	1.000 000**	E – 06	1.000 000**	E + 06
mile (U.S. statute)	meter (m)*	1.609 344**	E + 03	6.213 712	E – 04
	foot	5.280 000**	E + 03	1.893 939	E – 04

*SI conversions. All quantities are current to SI standards as of 1974.
**Conversion factor is exact and all following digits are zero. All other factors have been rounded.
The notation E + 03 is used in place of 10^3, and so on.

TABLE A-10 (continued)—CONVERSION FACTORS USEFUL IN PHASE BEHAVIOR (from Ref. 3)

To Convert From	To	Multiply By		Inverse	
Mass					
gram-mass	kilogram (kg)*	1.000 000**	E – 03	1.000 000**	E + 03
ounce-mass (avoirdupois)	kilogram (kg)*	2.834 952	E – 02	3.527 397	E + 01
	gram (g)	2.834 952	E + 01	3.527 397	E – 02
pound-mass	kilogram (kg)*	4.535 923 7**	E – 01	2.204 623	E + 00
	ounce-mass	1.600 000**	E + 01	6.250 000**	E – 02
slug	kilogram (kg)*	1.459 390	E + 01	6.852 178	E – 02
	pound-mass (lbm)	3.217 405	E + 01	3.108 095	E – 02
ton (U.S. short)	kilogram (kg)*	9.071 847	E + 02	1.102 311	E – 03
	pound-mass (lbm)	2.000 000**	E + 03	5.000 000**	E – 04
ton (U.S. long)	kilogram (kg)*	1.016 047	E + 03	9.842 064	E – 04
	pound-mass (lbm)	2.240 000**	E + 03	4.464 286	E – 04
ton (metric)	kilogram (kg)*	1.000 000**	E + 03	1.000 000**	E – 03
tonne	kilogram (kg)*	1.000 000**	E + 03	1.000 000**	E – 03
Pressure					
atmosphere (atm)	pascal (Pa)*	1.013 25	E + 05	9.869 23	E – 06
(Normal is 760 mm Hg)	mm Hg (0°C)	7.600 000**	E + 02	1.315 789	E – 03
	feet water (4°C)	3.389 95	E + 01	2.949 90	E – 02
	pound-force/square inch (psi)	1.469 60	E + 01	6.804 60	E – 02
	bar	1.013 25	E + 00	9.869 23	E – 01
bar (bar)	pascal (Pa)*	1.000 000**	E + 05	1.000 000**	E – 05
	pound-force/square inch (psi)	1.450 377	E + 01	6.894 757	E – 02
centimeter of Hg (32°F)	pascal (Pa)*	1.333 22	E + 03	7.500 64	E – 04
	pound-force/square inch (psi)	1.933 67	E – 01	5.171 51	E + 00
dyne/square centimeter (dyne/cm^2)	pascal (Pa)*	1.000 000**	E – 01	1.000 000**	E + 01
	pound force/square inch (psi)	1.450 377	E – 05	6.894 757	E + 04
feet of water (39.2°F)	pascal (Pa)*	2.988 98	E + 03	3.345 62	E – 04
	pound force/square inch (psi)	4.335 15	E – 01	2.306 73	E + 00
kilogram-force/square centimeter	pascal (Pa)*	9.806 650**	E + 04	1.019 716	E – 05
	bar	9.806 650**	E – 01	1.019 716	E + 00
	pound force/square inch (psi)	1.422 334	E + 01	7.030 695	E – 02
pound-force/inch^2 (psi)	pascal (Pa)*	6.894 757	E + 03	1.450 377	E – 04
Time					
day (d)	second (s)*	8.640 000**	E + 04	1.157 407	E – 05
	minute (min)	1.440 000**	E + 03	6.944 444	E – 04
	hour (h)	2.400 000**	E + 01	4.166 667	E – 02
hour (h)	second (s)*	3.600 000**	E + 03	2.777 778	E – 04
	minute (min)	6.000 000**	E + 01	1.666 667	E – 02
minute (min)	second (s)*	6.000 000**	E + 01	1.666 667	E – 02

*SI conversions. All quantities are current to SI standards as of 1974.
**Conversion factor is exact and all following digits are zero. All other factors have been rounded.
The notation E + 03 is used in place of 10^3, and so on.

TABLE A-10 (continued)—CONVERSION FACTORS USEFUL IN PHASE BEHAVIOR (from Ref. 3)

To Convert From	To	Multiply By		Inverse	
Viscosity					
centipoise (cp)	pascal-second (Pa · s)*	1.000 000**	E – 03	1.000 000**	E + 03
	dyne-second/square centimeter (dyne-s/cm^2)	1.000 000**	E – 02	1.000 000**	E + 02
		6.719 689	E – 04	1.488 164	E + 03
	pound-mass/foot-second (lbm/ft-sec)	2.088 543	E – 05	4.788 026	E + 04
	pound-force-second/square foot (lbf-sec/ft^2)	2.419 088	E + 00	4.133 789	E – 01
	pound-mass/foot-hour (lbm/ft-hr)				
centistoke (cSt)	square meter/second (m^2/s)*	1.000 000**	E – 06	1.000 000**	E + 06
	centipoise/gram-cubic centimeter (cp/g-cm^3)	1.000 000**	E + 00	1.000 000**	E + 00
poise	pascal-second (Pa · s)*	1.000 000**	E – 01	1.000 000**	E + 01
pound-mass/foot-second (lbm/ft-sec)	pascal-second (Pa · s)*	1.488 164	E + 00	6.719 689	E – 01
pound-mass/foot-hour (lbm/ft-hr)	pascal-second (Pa · s)*	4.133 789	E – 04	2.419 088	E + 03
pound-force-second/square foot (lbf-sec/ft^2)	pascal-second (Pa · s)*	4.788 026	E + 01	2.088 543	E – 02
Volume					
acre-foot (acre-ft)	cubic meter (m^3)*	1.233 482	E + 03	8.107 131	E – 04
	cubic foot (ft^3)	4.356 000**	E + 04	2.295 684	E – 05
	barrel (bbl)	7.758 368	E + 03	1.288 931	E – 04
barrel (bbl)	cubic meter (m^3)*	1.589 873	E – 01	6.289 811	E + 00
	cubic foot (ft^3)	5.614 583	E + 00	1.781 076	E – 01
	gallon (gal)	4.200 000**	E + 01	2.380 952	E – 02
cubic foot (ft^3)	cubic meter (m^3)*	2.831 685	E – 02	3.531 466	E + 01
	cubic inch (in.^{3})	1.728 000	E + 03	5.787 037	E – 04
	gallon (gal)	7.480 520	E + 00	1.336 805	E – 01
gallon (gal)	cubic meter (m^3)*	3.785 412	E – 03	2.641 720	E + 02
	cubic inch (in.^{3})	2.310 001	E + 02	4.329 003	E – 03
liter (L)	cubic meter (m^3)*	1.000 000**	E – 03	1.000 000**	E + 03
Volumetric rate					
barrel/day (B/D)	cubic meter/second (m^3/s)*	1.840 131	E – 06	5.434 396	E + 05
	cubic meter/hour (m^3/h)	6.624 472	E – 03	1.509 554	E + 02
	cubic meter/day (m^3/d)	1.589 873	E – 01	6.289 810	E + 00
	cubic centimeter/second (cm^3/s)	1.840 131	E + 00	5.434 396	E – 01
	cubic foot/minute (ft^3/min)	3.899 016	E – 03	2.564 750	E + 02
	gallon/minute (gal/min)	2.916 667	E – 02	3.428 571	E + 01
cubic foot/minute (ft^3/min)	cubic meter/second (m^3/s)*	4.719 474	E – 04	2.118 880	E + 03
cubic foot/second (ft^3/sec)	cubic meter/second (m^3/s)*	2.831 685	E – 02	3.531 466	E + 01
gallon/minute (gal/min)	cubic meter/second (m^3/s)*	6.309 020	E – 05	1.585 032	E + 04

*SI conversions. All quantities are current to SI standards as of 1974.
**Conversion factor is exact and all following digits are zero. All other factors have been rounded. The notation E + 03 is used in place of 10^3, and so on.

TABLE A-11—ADDITIONAL CONVERSION FACTORS USEFUL IN PHASE BEHAVIOR

To Convert From	To	Multiply By		Inverse	
Amount of substance					
mole (mol)	pound-mass mole (lbm mol)	2.204 623	E + 03	4.535 923	E – 04
	gram mole (gmol)	1.000 000*	E + 00	1.000 000*	E + 00
	kilomole (kmol)	1.000 000*	E – 03	1.000 000*	E + 03
kilomole (kmol)	mole (gmol)	1.000 000*	E + 03	1.000 000*	E – 03
	gram mole (gmol)	1.000 000*	E + 03	1.000 000*	E – 03
	pound-mass mole (lbm mol)	4.535 923	E – 01	2.204 623	E + 00
Diffusivity					
square centimeter/second (cm^2/s)	square meter/second (m^2/s)	1.000 000*	E – 04	1.000 000*	E + 04
	square millimeter/second (mm^2/s)	1.000 000*	E + 02	1.000 000*	E – 02
	square foot/second (ft^2/sec)	1.076 390	E – 03	9.290 304	E + 02
	square foot/hour (ft^2/hr)	3.875 000	E + 00	2.580 640	E – 01
Surface tension					
milliNewton/meter (mN/m)	dyne/centimeter (dyne/cm)	1.000 000*	E + 00	1.000 000*	E + 00
Energy					
British thermal unit (Btu)	kiloJoule (kJ)	1.055 056	E + 00	9.478 160	E – 01
	calorie (cal)	2.521 640	E + 02	3.965 660	E – 03
	kilocalorie (kcal)	2.521 640	E – 01	3.965 660	E + 00
	erg	1.055 056	E + 10	9.478 160	E – 11

*Conversion factor is exact.

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