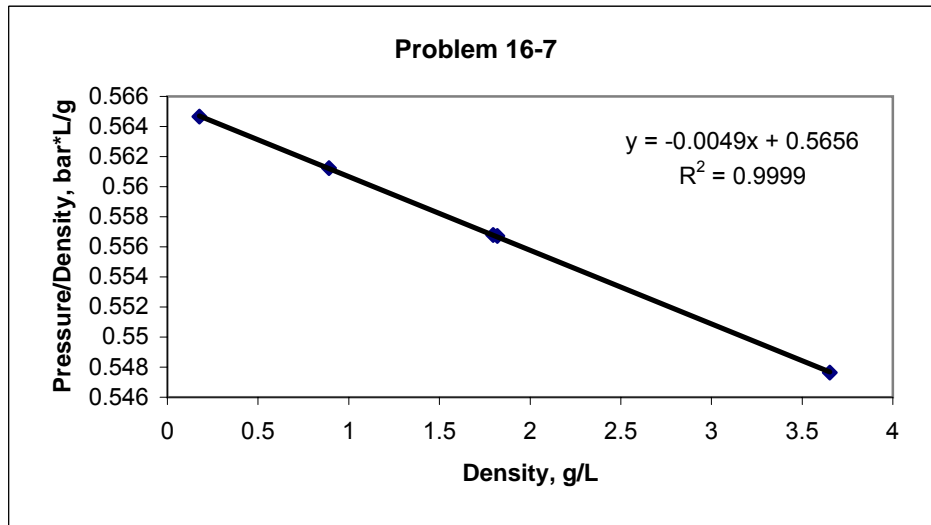


Problem 16-7

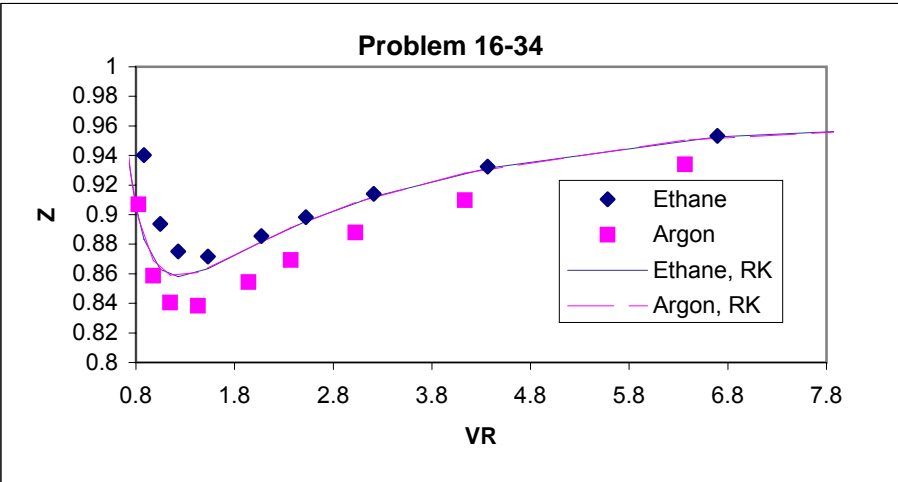
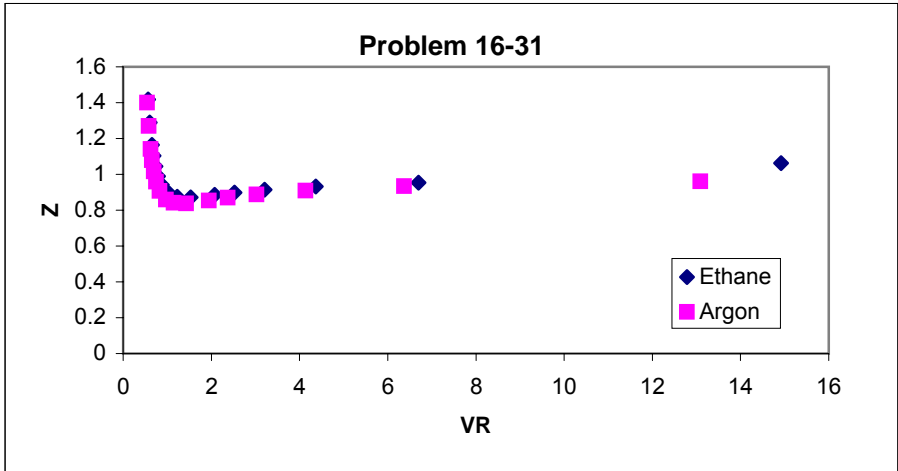
P (bar)	ρ (g/L)	P/ρ (bar*L/g)	
0.1	0.1771	0.564652739	$M=RT/b$
0.5	0.8909	0.561230217	$b=0.5656$
1	1.796	0.556792873	$M=44.1 \text{ g/mol}$
1.01325	1.82	0.556730769	
2	3.652	0.547645126	



Problems 16-31 to 16-34, Page 1

Ethane T=500 K Vc=0.1480 TR=1.64 Pc=48.714 bar

P (bar)	V (L/mol)	V _R	Z, IG	Z, VDW	Z, RK	PR
0.5	83.076	561.3243	0.99917	0.999372	0.999376	0.010264
2	20.723	140.0203	0.996957	0.997487	0.997507	0.041056
10	4.105	27.73649	0.987432	0.987432	0.98765	0.20528
20	2.208	14.91892	1.062241	0.976873	0.977504	0.41056
40	0.9907	6.693919	0.953226	0.949929	0.95259	0.821119
60	0.6461	4.365541	0.932491	0.925534	0.9313	1.231679
80	0.475	3.209459	0.914066	0.902161	0.912125	1.642238
100	0.3734	2.522973	0.89819	0.88034	0.895441	2.052798
120	0.3068	2.072973	0.885585	0.860697	0.881625	2.463358
160	0.2265	1.530405	0.87173	0.830226	0.863527	3.284477
200	0.1819	1.229054	0.875098	0.814007	0.858116	4.105596
240	0.1548	1.045946	0.893668	0.81192	0.863093	4.926715
300	0.1303	0.880405	0.940285	0.830145	0.883435	6.158394
350	0.1175	0.793919	0.989236	0.859679	0.907336	7.184793
400	0.1085	0.733108	1.043959	0.898094	0.934407	8.211192
450	0.1019	0.688514	1.103013	0.942177	0.962649	9.237591
500	0.09676	0.653784	1.16375	0.990963	0.991653	10.26399
600	0.08937	0.603851	1.289843	1.096203	1.048831	12.31679
700	0.08421	0.568986	1.417933	1.208899	1.104349	14.36959



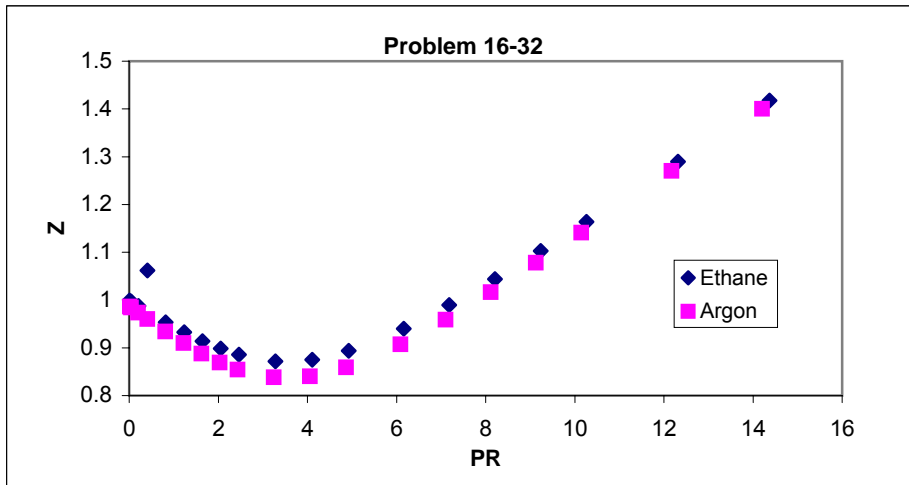
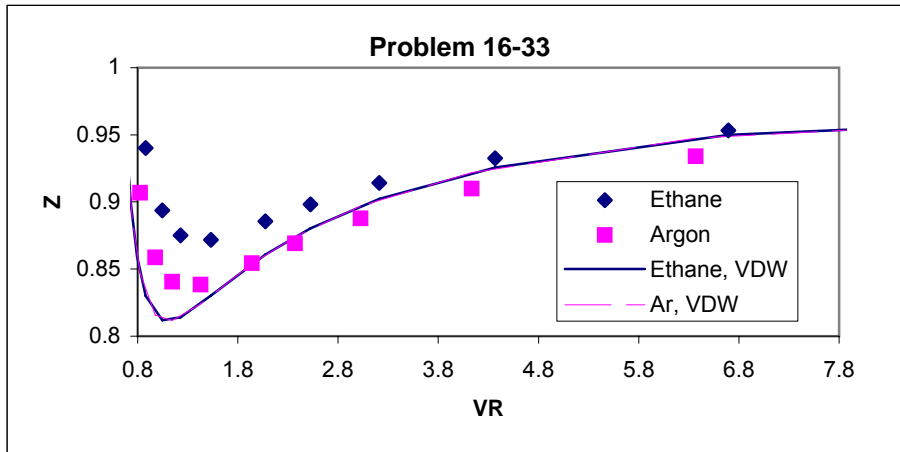
Problems 16-31 to 16-34, Page 2

Argon T=247 K

V_c=0.07530

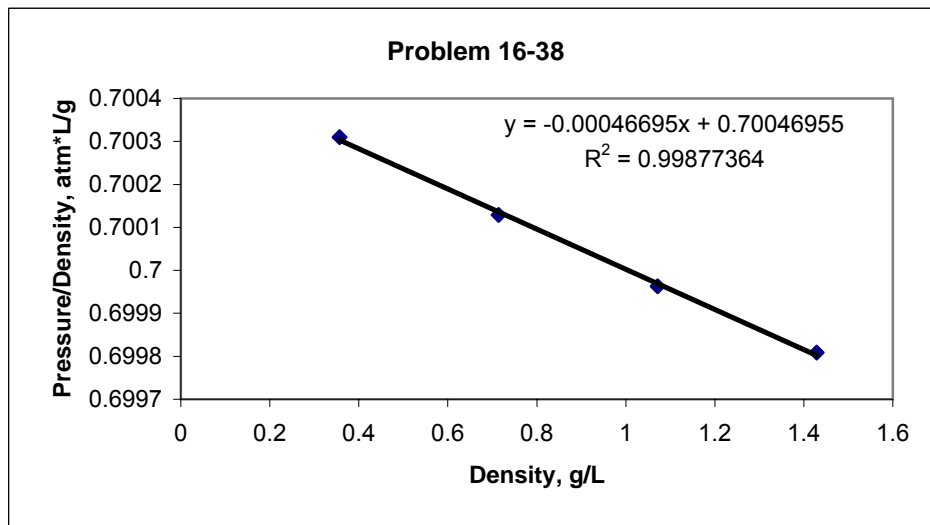
P_c = 49.288 bar

P (bar)	V (L/mol)	V _R	Z, IG	Z, VDW	Z, RK	PR
0.5	40.506	537.9283	0.98618	0.999345	0.999349	0.010144
2	10.106	134.2098	0.984184	0.997379	0.9974	0.040578
10	1.999	26.54714	0.973374	0.986876	0.98711	0.202889
20	0.9857	13.09031	0.959935	0.973726	0.974521	0.405778
40	0.4795	6.367862	0.933933	0.947513	0.950427	0.811557
60	0.3114	4.135458	0.909781	0.921794	0.928148	1.217335
80	0.2279	3.02656	0.887772	0.897115	0.908156	1.623113
100	0.1785	2.370518	0.869171	0.874247	0.891021	2.028891
120	0.1462	1.941567	0.854271	0.853956	0.877204	2.43467
160	0.1076	1.428951	0.838299	0.824187	0.860794	3.246226
200	0.0863	1.146082	0.840442	0.811591	0.859028	4.057783
240	0.07348	0.97583	0.858712	0.815843	0.868948	4.869339
300	0.06208	0.824436	0.906859	0.84669	0.89733	6.086674
350	0.05626	0.747145	0.958815	0.88739	0.927153	7.10112
400	0.05219	0.693094	1.016516	0.936812	0.95933	8.115566
450	0.04919	0.653254	1.077845	0.991835	0.992155	9.130011
500	0.04687	0.622444	1.141121	1.050894	1.024968	10.14446
600	0.04348	0.577424	1.270304	1.177621	1.089424	12.17335
700	0.04108	0.545551	1.400217	1.313314	1.151918	14.20224



Problem 16-38

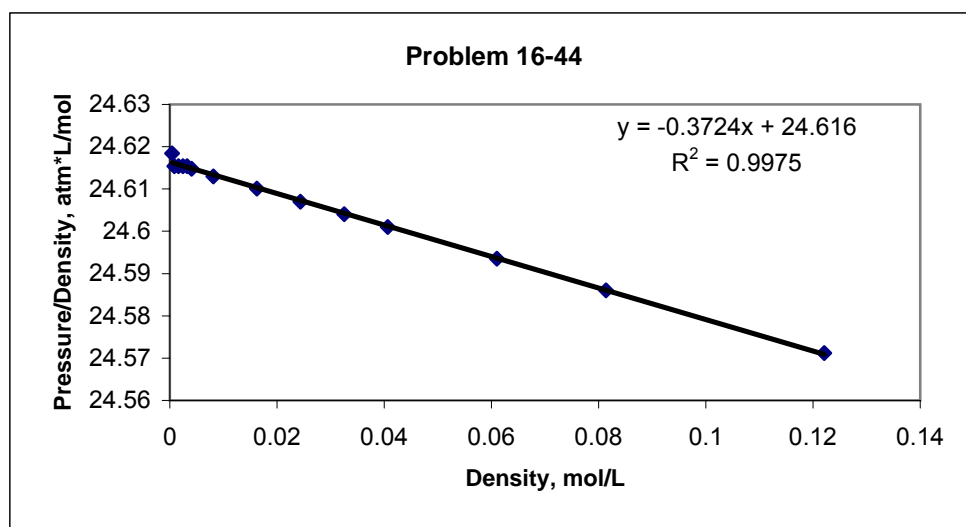
P (atm)	ρ (g/L)	P/ρ (atm*L/g)
0.25	0.356985	0.700309537
0.5	0.714154	0.700129104
0.75	1.071485	0.699963135
1	1.428962	0.699808672



Problem 16-44

P (atm)	ρ (mol/L)	P/ ρ (atm*L/mol)
0.01	0.000406	24.61841457
0.02	0.000813	24.61538462
0.04	0.001625	24.61538462
0.06	0.002438	24.61538462
0.08	0.00325	24.61538462
0.1	0.004063	24.61477871
0.2	0.008126	24.61296119
0.4	0.016254	24.61008398
0.6	0.024383	24.60700561
0.8	0.032515	24.60402891
1	0.040649	24.60103275
1.5	0.060992	24.59355059
2	0.081347	24.5860629
3	0.122094	24.571232

24.61734
-0.015128
-15.12755



Problem 16-57

Variables

σ	3.28E-09 dm
ϵ/k_B	136.5 K
λ	1.68
N_A	6.02E+23 molecules/mol

Square Well

T	B_{2V}
170	-0.16038
220	-0.09849
270	-0.06493
320	-0.044
370	-0.02974
420	-0.01941
470	-0.01159
520	-0.00547
570	-0.00055
620	0.003488
670	0.006864
720	0.009727
770	0.012185
820	0.014319
870	0.016188
920	0.017839
970	0.019308

Experimental

T	B_{2V}	
273.16	-62.7	-0.0627
323.16	-42.78	-0.04278
373.16	-29.28	-0.02928
423.16	-18.13	-0.01813
473.16	-10.75	-0.01075
573.16	0.42	0.00042
673.16	7.42	0.00742
773.16	12.7	0.0127
873.16	17.19	0.01719

