General Data Table

Flask #	Carbon Dose (mg)	D_o (mg/l)	C (ug/l)	C (mg/l)	C_o - C (mg/l)	q (mg/l)/(mg/l)
1	1005	4020	58.2	0.0582	514.9418	0.128095
2	835	3340	87.3	0.0873	514.9127	0.154165
3	641	2564	116.4	0.1164	514.8836	0.200813
4	491	1964	300	0.3	514.7	0.262067
5	391	1564	407	0.407	514.593	0.329024
6	298	1192	786	0.786	514.214	0.431388
7	290	1160	902	0.902	514.098	0.443188
8	253	1012	2940	2.94	512.06	0.505988
9	0	0	515000	515	0	#DIV/0!

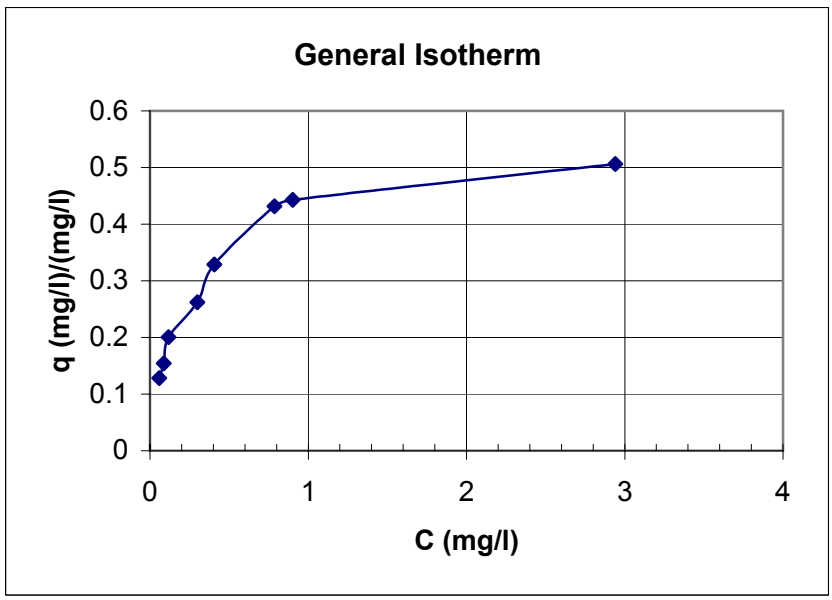
D_o = Carbon Dose/0.25 liter

!!! Data for Flask 9 cannot be plotted

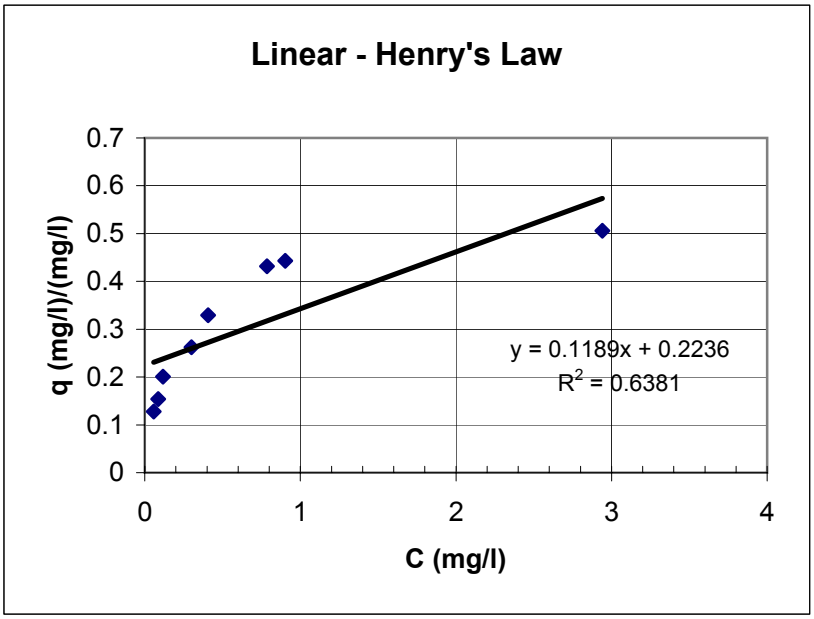
C (mg/l) = C (ug/l) / 1 x 10^3

C_o = 515 mg/l

$q = (C_o - C)/D_o$



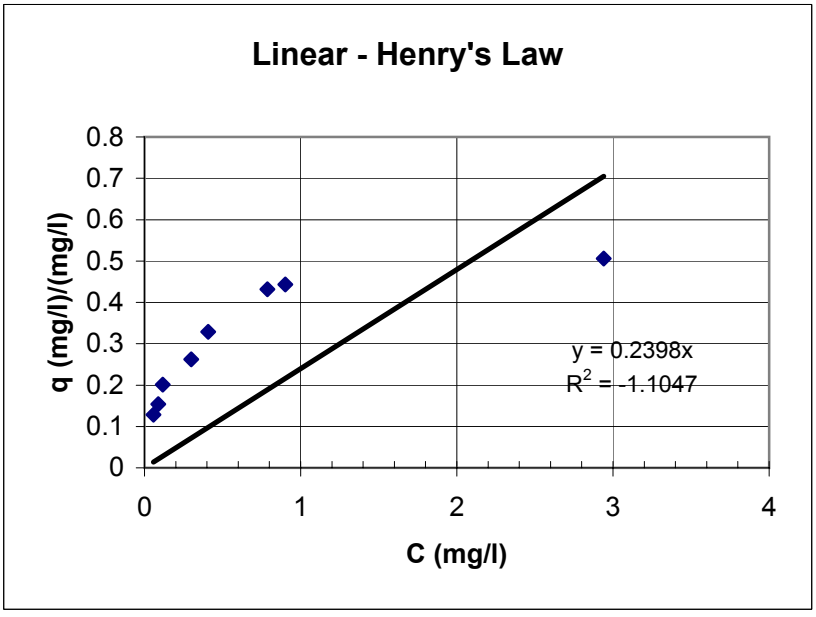
LINEAR (HENRY'S LAW)



q = 0.119 c + 0.224

. Henry's law const. = 0.119 l/mg

But a "true" Linear goes through the Origin (0,0)



Linear/Henry's Law going through Origin

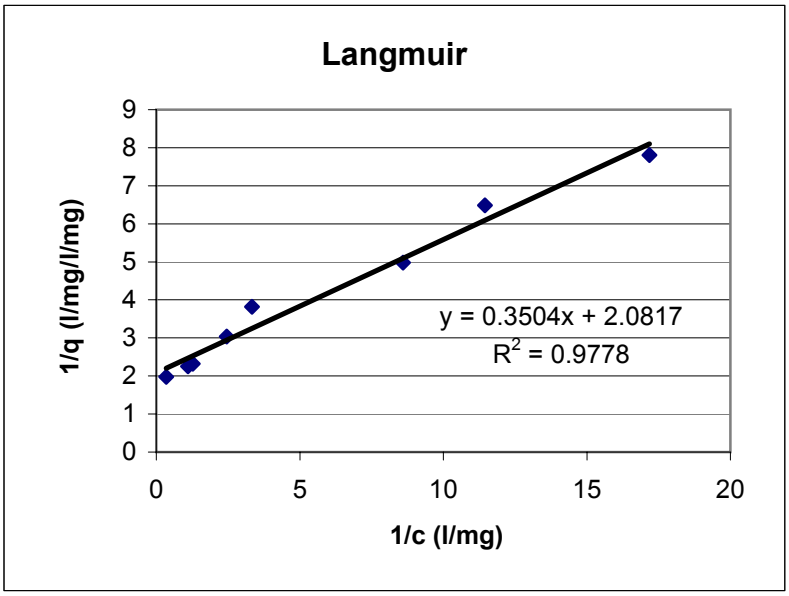
q = 0.239 c

Henry's law constant = 0.239 l/mg

LANGMUIR

Flask #	Carbon Dose (mg)	D_o (mg/l)	C (ug/l)	C (mg/l)	C_o - C (mg/l)	q (mg/l)/(mg/l)	1/C (l/mg)	1/q
1	1005	4020	58.2	0.0582	514.9418	0.128095	17.18213	7.806707
2	835	3340	87.3	0.0873	514.9127	0.154165	11.45475	6.486536
3	641	2564	116.4	0.1164	514.8836	0.200813	8.591065	4.979766
4	491	1964	300	0.3	514.7	0.262067	3.333333	3.815815
5	391	1564	407	0.407	514.593	0.329024	2.457002	3.039295
6	298	1192	786	0.786	514.214	0.431388	1.272265	2.318101
7	290	1160	902	0.902	514.098	0.443188	1.108647	2.256379
8	253	1012	2940	2.94	512.06	0.505988	0.340136	1.976331
9	0	0	515000	515	0	#DIV/0!	0.001942	#DIV/0!

$q = (q_{max} K c) / (1 + Kc)$



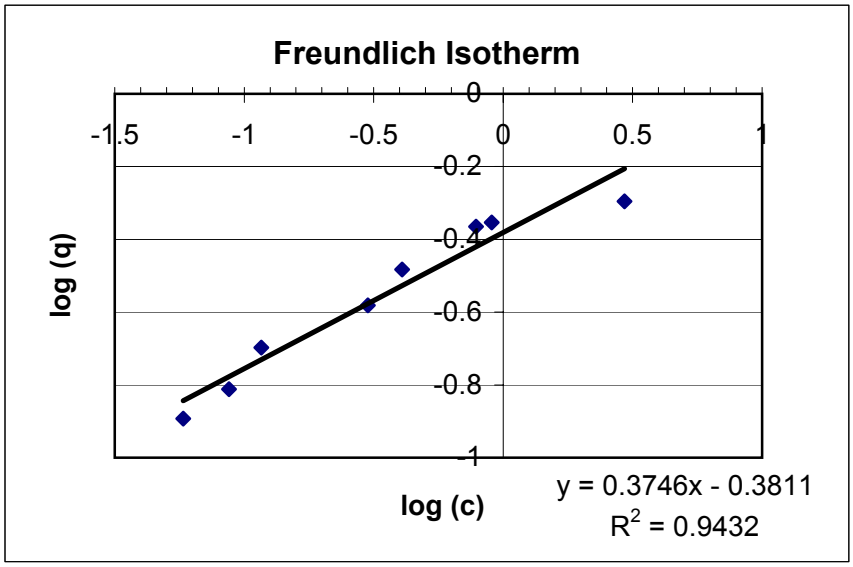
Langmuir constants

q_{max} = 1/2.0817 = 0.480 (mg/l/mg/l) or unitless

K_A = (1/0.3504)/0.480 = 5.95 (l/mg)

FREUNDLICH

Flask #	Carbon Dose (mg)	D_o (mg/l)	C (ug/l)	C (mg/l)	C_o - C (mg/l)	q (mg/l)/(mg/l)	log(C)	log(q)
1	1005	4020	58.2	0.0582	514.9418	0.128095	-1.235077	-0.892468
2	835	3340	87.3	0.0873	514.9127	0.154165	-1.058986	-0.812013
3	641	2564	116.4	0.1164	514.8836	0.200813	-0.934047	-0.697209
4	491	1964	300	0.3	514.7	0.262067	-0.522879	-0.581587
5	391	1564	407	0.407	514.593	0.329024	-0.390406	-0.482773
6	298	1192	786	0.786	514.214	0.431388	-0.104577	-0.365132
7	290	1160	902	0.902	514.098	0.443188	-0.044793	-0.353412
8	253	1012	2940	2.94	512.06	0.505988	0.468347	-0.29586
9	0	0	515000	515	0	#DIV/0!	2.711807	#DIV/0!



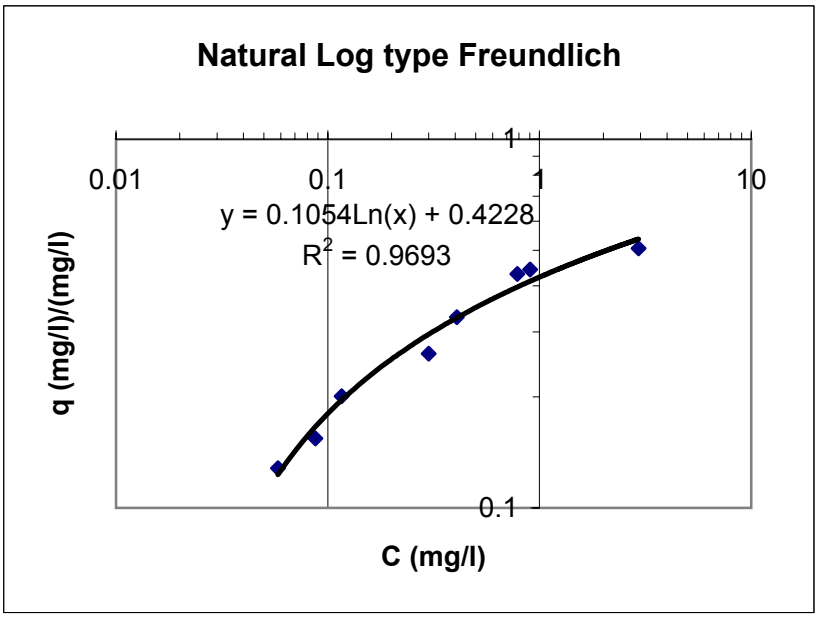
$q = K_F c^{1/n}$

Freundlich Constants

n = 1/3.746 = 2.67

K_F = Inv Log (-0.3811) = 0.416

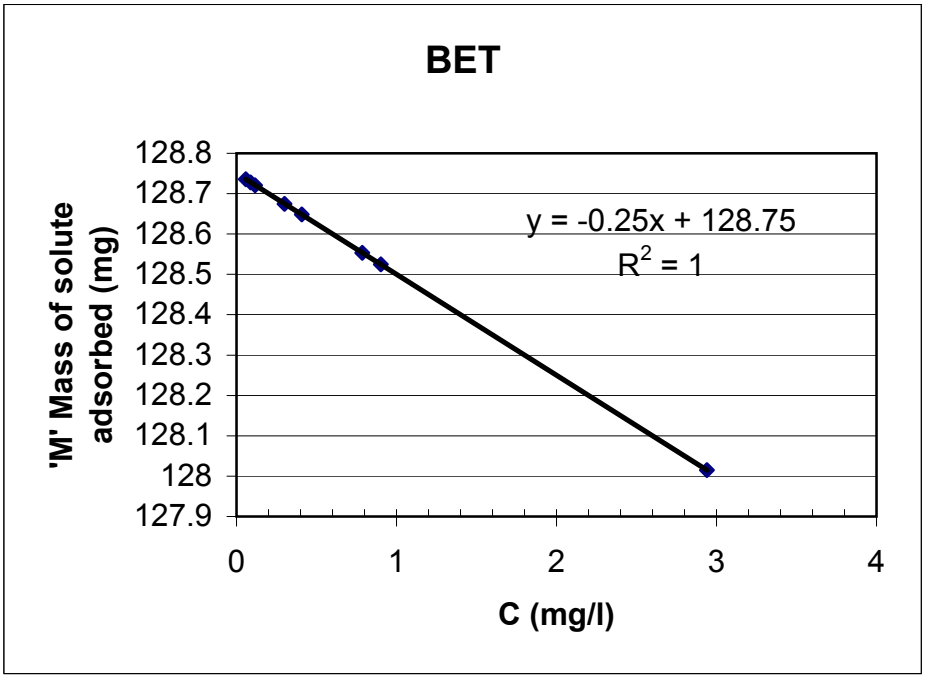
An alternate to the Freundlich is to try Natural Log or log to another power but a true Freundlich uses common log



BET ISOTHERM

This method is not really for liquids. Adust Eqn. To convert from gas to liquid
Volume -> Mass
Pressure -> Concentration

Flask #	Carbon Dose (mg)	D_o (mg/l)	C (ug/l)	C (mg/l)	$C_o - C$ (mg/l)	q (mg/l)/(mg/l)	M $(C_o - C)*Vol$ (mg)	C (mg/l)
1	1005	4020	58.2	0.0582	514.9418	0.128095	128.7355	0.0582
2	835	3340	87.3	0.0873	514.9127	0.154165	128.7282	0.0873
3	641	2564	116.4	0.1164	514.8836	0.200813	128.7209	0.1164
4	491	1964	300	0.3	514.7	0.262067	128.675	0.3
5	391	1564	407	0.407	514.593	0.329024	128.6483	0.407
6	298	1192	786	0.786	514.214	0.431388	128.5535	0.786
7	290	1160	902	0.902	514.098	0.443188	128.5245	0.902
8	253	1012	2940	2.94	512.06	0.505988	128.015	2.94
9	0	0	515000	515	0	#DIV/0!	0	515



M = 128.75 - 0.25 C