

2010 ACS Exams General Chemistry Data Sheet

ABBREVIATIONS AND SYMBOLS			
moles of substance	<i>n</i>	equilibrium constant	<i>K</i>
ampere	<i>A</i>	Faraday constant	<i>F</i>
atmosphere	atm	free energy	<i>G</i>
atomic mass unit	amu	frequency	ν
atomic molar mass	<i>A</i>	gas constant	<i>R</i>
Avogadro constant	N_A	hour	<i>h</i>
Celsius temperature	°C	joule	<i>J</i>
coulomb	<i>C</i>	kelvin	<i>K</i>
electromotive force	<i>E</i>	liter	<i>L</i>
energy of activation	E_a	measure of pressure mmHg	<i>t</i>
enthalpy	<i>H</i>	milli- prefix	<i>m</i>
entropy	<i>S</i>	molal	<i>m</i>
		molarity	<i>M</i>
		molar mass	<i>M</i>
		mole	mol
		Planck's constant	<i>h</i>
		pressure	<i>P</i>
		rate constant	<i>k</i>
		reaction quotient	<i>Q</i>
		second	<i>s</i>
		temperature, K	<i>T</i>
		time	<i>t</i>
		volt	<i>V</i>
		volume	<i>V</i>

CONSTANTS
$R = 8.314 \text{ J}\cdot\text{mol}^{-1}\cdot\text{K}^{-1}$
$R = 0.0821 \text{ L}\cdot\text{atm}\cdot\text{mol}^{-1}\cdot\text{K}^{-1}$
$R_H = 2.18 \times 10^{-18} \text{ J}$
$1 \text{ F} = 96,500 \text{ C}\cdot\text{mol}^{-1}$
$1 \text{ F} = 96,500 \text{ J}\cdot\text{V}^{-1}\cdot\text{mol}^{-1}$
$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$
$h = 6.626 \times 10^{-34} \text{ J}\cdot\text{s}$
$c = 2.998 \times 10^8 \text{ m}\cdot\text{s}^{-1}$
$K_w (\text{at } 25 \text{ }^\circ\text{C}) = 1.00 \times 10^{-14}$
$0^\circ\text{C} = 273.15 \text{ K}$

EQUATIONS		
$\ln\left(\frac{k_2}{k_1}\right) = \frac{E_a}{R} \left(\frac{1}{T_1} - \frac{1}{T_2}\right)$	$E = E^\circ - \frac{RT}{nF} \ln Q$	$\ln \frac{P_2}{P_1} = \frac{-\Delta H_{\text{vap}}}{R} \left(\frac{1}{T_2} - \frac{1}{T_1}\right)$
At 25 °C		
$\text{pH} = \text{p}K_a + \log\left(\frac{[\text{base}]}{[\text{acid}]}\right)$ or $\text{pOH} = \text{p}K_b + \log\left(\frac{[\text{acid}]}{[\text{base}]}\right)$	$E = E^\circ - \frac{0.0592}{n} \log Q$	Integrated Rate Laws
$\Delta T_f = K_f m$ $\Delta T_b = K_b m$	$\Delta G^\circ = -RT \ln K$	first order: $\ln[A] = \ln[A]_0 - kt$
		second order: $\frac{1}{[A]} = kt + \frac{1}{[A]_0}$

PERIODIC TABLE OF THE ELEMENTS

	1															18			
	1A															8A			
	1	2											13	14	15	16	17	18	
	H 1.008	He 4.003											3A	4A	5A	6A	7A	8A	
	3	4											5	6	7	8	9	10	
	Li 6.941	Be 9.012											B 10.81	C 12.01	N 14.01	O 16.00	F 19.00	Ne 20.18	
	11	12	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
	Na 22.99	Mg 24.31	3B	4B	5B	6B	7B	8B	8B	8B	1B	2B	Al 26.98	Si 28.09	P 30.97	S 32.07	Cl 35.45	Ar 39.95	
	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	
	K 39.10	Ca 40.08	Sc 44.96	Ti 47.88	V 50.94	Cr 52.00	Mn 54.94	Fe 55.85	Co 58.93	Ni 58.69	Cu 63.55	Zn 65.39	Ga 69.72	Ge 72.61	As 74.92	Se 78.96	Br 79.90	Kr 83.80	
	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	
	Rb 85.47	Sr 87.62	Y 88.91	Zr 91.22	Nb 92.91	Mo 95.94	Tc (98)	Ru 101.1	Rh 102.9	Pd 106.4	Ag 107.9	Cd 112.4	In 114.8	Sn 118.7	Sb 121.8	Te 127.6	I 126.9	Xe 131.3	
	55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	
	Cs 132.9	Ba 137.3	La 138.9	Hf 178.5	Ta 180.9	W 183.8	Re 186.2	Os 190.2	Ir 192.2	Pt 195.1	Au 197.0	Hg 200.6	Tl 204.4	Pb 207.2	Bi 209.0	Po (209)	At (210)	Rn (222)	
	87	88	89	104	105	106	107	108	109	110	111	112					116	118	
	Fr (223)	Ra (226)	Ac (227)	Rf (261)	Db (262)	Sg (263)	Bh (262)	Hs (265)	Mt (266)	Ds (269)	Rg (272)	Unb (277)	Uuq (277)					Uuh (277)	Uuo (277)
	58	59	60	61	62	63	64	65	66	67	68	69	70	71					
	Ce 140.1	Pr 140.9	Nd 144.2	Pm (145)	Sm 150.4	Eu 152.0	Gd 157.3	Tb 158.9	Dy 162.5	Ho 164.9	Er 167.3	Tm 168.9	Yb 173.0	Lu 175.0					
	90	91	92	93	94	95	96	97	98	99	100	101	102	103					
	Th 232.0	Pa 231.0	U 238.0	Np (237)	Pu (244)	Am (243)	Cm (247)	Bk (247)	Cf (251)	Es (252)	Fm (257)	Md (258)	No (259)	Lr (262)					