

CHEM 122O (Rowley)

Exam 3 (Chapters 12-13) Fall 2025

Formulas

$$pH = -\log[\text{H}_3\text{O}^+]$$

$$[\text{H}_3\text{O}^+] = 10^{-pH}$$

$$pOH = -\log[\text{OH}^-]$$

$$[\text{OH}^-] = 10^{-pOH}$$

$$pH + pOH = 14$$

$$[\text{H}_3\text{O}^+][\text{OH}^-] = K_w = 1.00 \times 10^{-14}$$

$$K_a K_b = K_w$$

$$pH = pK_a + \log \frac{B}{A}$$

$$pK_a = -\log K_a$$

$$\frac{C_A V_A}{\nu_A} = \frac{C_T V_T}{\nu_T}$$

Constants

$$R = 8.314 \frac{J}{mol \text{ } K}$$

$$R = 0.08206 \frac{Latm}{mol \text{ } K}$$

Periodic Table of the Elements

1	H	2											He
	Hydrogen 1.008	IIA 2A											Helium 4.003
3	Li	Be	Boron 9.012										Ne
11	Na	Mg	Magnesium 24.305										Neon 20.180
19	K	Ca	Calcium 40.078										
37	Rb	Sr	Rubidium 85.468										
55	Cs	Ba	Cesium 132.905										
87	Fr	Ra	Francium 223.020										
58	Ce	Pr	Cerium 140.116										
90	Th	Pa	Thorium 232.038										
13	B	C	Boron 10.811										
113	Al	Si	Aluminum 26.982										
131	Ti	V	Titanium 47.867										
140	Cr	Fe	Chromium 51.996										
141	Mn	Co	Manganese 54.938										
142	Mo	Rh	Molybdenum 95.95										
143	Tc	Pd	Technetium 98.907										
144	Ru	Ag	Ruthenium 101.07										
145	Rh	Pt	Rhodium 102.906										
146	Pd	Au	Palladium 106.42										
147	Ag	Hg	Silver 107.868										
148	Cd	Tl	Cadmium 112.414										
149	In	Pb	Inium 114.818										
150	Sn	Bi	Indium 118.711										
151	Sb	Po	Antimony 121.760										
152	Te	At	Tellurium 127.6										
153	I	Rn	Iodine 126.904										
154	Xe	At	Xenon 131.294										
155	Cs	Ds	Cesium 132.905										
156	Ba	Mt	Barium 137.328										
157	La	Rg	Lanthanum 138.905										
158	Hf	Os	Hafnium 178.49										
159	Ta	Ir	Tantalum 180.948										
160	W	Pt	Tungsten 183.84										
161	Ds	Au	Rhenium 186.207										
162	Db	Rg	Darmstadtium 281										
163	Gd	Tb	Gadolinium 157.25										
164	Eu	Dy	Europium 151.964										
165	Sm	Ho	Samarium 150.36										
166	Pm	Tm	Praseodymium 144.243										
167	Nd	Er	Neodymium 140.908										
168	Am	Yb	Promethium 144.913										
169	Pu	Lu	Americium 243.061										
170	Np	Fm	Plutonium 244.064										
171	Fr	Md	Neptunium 237.048										
172	Ra	Cf	Curium 247.070										
173	Ac	Es	Actinium 227.028										
174	Fr	Fm	Mendelevium 257.095										
175	Fr	Th	Berkelium 247.070										
176	Fr	Pa	Protactinium 231.036										
177	Fr	U	Uranium 238.029										
178	Fr	U	Thorium 232.038										
179	Fr	U	Radium 226.025										
180	Fr	U	Francium 223.020										
181	Fr	U	Actinium 227.028										
182	Fr	U	Thorium 232.038										
183	Fr	U	Rutherfordium 261										
184	Fr	U	Protactinium 231.036										
185	Fr	U	Uranium 238.029										
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