

TEST 1 (of 3)

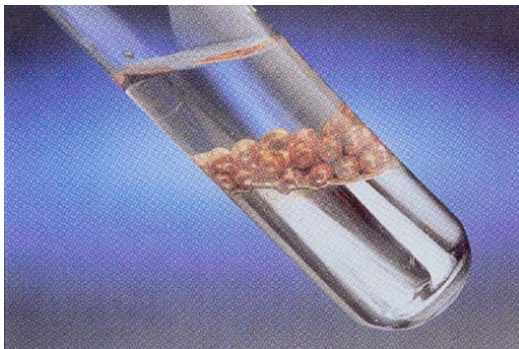
Show all of your work. Students should use significant figures and express their answers in scientific notation.

1. Give one example of a metallic element and one example of a molecular element.
2. Express the following measurements using scientific notation to 3 significant figures.
(a) 0.000000776 m (b) 536.028 kg
3. Categorize the following as either a physical (P) or chemical (C) property.
(a) Chlorine is a green gas.
(b) Hydrogen explodes when ignited in air.
(c) The density of aluminum is 2.70 g/cm^3 .
(d) Aqueous silver nitrate forms a white precipitate when added to aqueous sodium chloride.
4. (a) Write down a conversion factor (CF) ratio for converting milligrams to grams.

(b) The density of water at $21.2 \text{ }^\circ\text{C}$ is 0.997948 g/cm^3 .
Calculate the volume of water (mL) in $2.49 \times 10^3 \text{ mg}$.

(SHOW ALL YOUR WORK...USE SIG. FIGS.)

5. The following photo shows copper balls, immersed in water, floating on top of mercury. Label the liquids and solids in this photo **using their chemical formulas**. Which substance is most dense? Which is least dense?



6. (a) How many electrons are there in a sodium atom?
- (b) Does an atom of sodium gain or lose electrons when forming an ion?
- (c) How many electrons are gained or lost by the atom?
- (d) Write down the chemical reaction showing the formation of a sodium ion.
7. Calculate the molar mass (g/mol) of magnesium chloride to 3 significant figures.
8. Give the formulas of the following compounds:
- (a) Strontium chloride (b) Copper (II) nitrate
- (c) Hydrochloric acid (d) Sodium hydroxide
9. Name the following compounds:
- (a) $\text{Fe}(\text{NO}_3)_2$ (b) N_2O
- (c) CaSO_4 (d) CO_2
10. Balance each chemical reaction below by inspection.
- (a) $\text{Al} + \text{Cl}_2 \rightarrow \text{Al}_2\text{Cl}_6$
- (b) $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$
- (c) $\text{Zn} + \text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
- (d) $\text{H}_2\text{SO}_4 + \text{NH}_3 \rightarrow (\text{NH}_4)_2\text{SO}_4$

BONUS PROBLEMS:

Chose **one** from the three bonus problems below. DO NOT DO THEM ALL...I WILL NOT INCLUDE POINTS FOR BONUS IF ALL THREE ARE ATTEMPTED!!!

BONUS:

Calculate the percent composition by mass of HNO_3 .

BONUS2:

Write a balanced equation (with state symbols) for the formation of salt from the reaction between sodium metal and chlorine gas.

BONUS3:

Write out the following reaction using chemical symbols and balance the following reaction for the addition of a copper penny to nitric acid, include state symbols:

copper + nitric acid \rightarrow copper (II) nitrate + nitrogen dioxide gas + water

THE PERIODIC TABLE

		1 IA		2 IIA		3-10 IIIB-IVB, VB-VIIB, VIIIB, IIB										11 IB		12 IIB		13-18 IIIA-VIIIA		18 VIIIA																																																																																																																																																																																			
		H 1 1.008 Hydrogen		He 2 4.00 Helium		Legend: H — SYMBOL, 1 — ATOMIC NUMBER, 1.008 — ATOMIC WEIGHT, Hydrogen — NAME																																																																																																																																																																																																			
1	H 1 1.008 Hydrogen	2	He 2 4.00 Helium	3	Li 3 6.94 Lithium	4	Be 4 9.01 Beryllium	5	B 5 10.81 Boron	6	C 6 12.01 Carbon	7	N 7 14.01 Nitrogen	8	O 8 16.00 Oxygen	9	F 9 19.00 Fluorine	10	Ne 10 20.18 Neon	11	Na 11 22.99 Sodium	12	Mg 12 24.31 Magnesium	13	Al 13 26.98 Aluminum	14	Si 14 28.09 Silicon	15	P 15 30.97 Phosphorus	16	S 16 32.07 Sulfur	17	Cl 17 35.45 Chlorine	18	Ar 18 39.95 Argon	19	K 19 39.10 Potassium	20	Ca 20 40.08 Calcium	21	Sc 21 44.96 Scandium	22	Ti 22 47.88 Titanium	23	V 23 50.94 Vanadium	24	Cr 24 52.00 Chromium	25	Mn 25 54.94 Manganese	26	Fe 26 55.85 Iron	27	Co 27 58.93 Cobalt	28	Ni 28 58.69 Nickel	29	Cu 29 63.55 Copper	30	Zn 30 65.39 Zinc	31	Ga 31 69.72 Gallium	32	Ge 32 72.61 Germanium	33	As 33 74.92 Arsenic	34	Se 34 78.96 Selenium	35	Br 35 79.90 Bromine	36	Kr 36 83.80 Krypton	37	Rb 37 85.47 Rubidium	38	Sr 38 87.62 Strontium	39	Y 39 88.91 Yttrium	40	Zr 40 91.22 Zirconium	41	Nb 41 92.91 Niobium	42	Mo 42 95.94 Molybdenum	43	Tc 43 (97.9) Technetium	44	Ru 44 101.07 Ruthenium	45	Rh 45 102.91 Rhodium	46	Pd 46 106.42 Palladium	47	Ag 47 107.87 Silver	48	Cd 48 112.41 Cadmium	49	In 49 114.82 Indium	50	Sn 50 118.71 Tin	51	Sb 51 121.76 Antimony	52	Te 52 127.60 Tellurium	53	I 53 126.90 Iodine	54	Xe 54 131.29 Xenon	55	Cs 55 132.91 Cesium	56	Ba 56 137.33 Barium	57	La 57 138.91 Lanthanum	58	Ce 58 140.12 Cerium	59	Pr 59 140.91 Praseodymium	60	Nd 60 144.24 Neodymium	61	Pm 61 (145) Promethium	62	Sm 62 150.36 Samarium	63	Eu 63 152.07 Europium	64	Gd 64 157.25 Gadolinium	65	Tb 65 158.93 Terbium	66	Dy 66 162.50 Dysprosium	67	Ho 67 164.93 Holmium	68	Er 68 167.26 Erbium	69	Tm 69 168.93 Thulium	70	Yb 70 173.04 Ytterbium	71	Lu 71 174.97 Lutetium	72	Fr 87 223.02 Francium	73	Ra 88 226.03 Radium	74	Ac 89 227.03 Actinium	75	Rf 104 (261) Rutherfordium	76	Db 105 (262) Dubnium	77	Sg 106 (263) Seaborgium	78	Bh 107 (262) Bohrium	79	Hs 108 (265) Hassium	80	Mt 109 (266) Meitnerium	81	Tl 81 204.38 Thallium	82	Pb 82 207.2 Lead	83	Bi 83 208.98 Bismuth	84	Po 84 (209) Polonium	85	At 85 (210) Astatine	86	Rn 86 (222) Radon	87	U 92 238.03 Uranium	88	Th 90 232.04 Thorium	89	Pa 91 231.04 Protactinium	90	U 92 238.03 Uranium	91	Np 93 237.05 Neptunium	92	Pu 94 (240) Plutonium	93	Am 95 243.06 Americium	94	Cm 96 (247) Curium	95	Bk 97 (248) Berkelium	96	Cf 98 (251) Californium	97	Es 99 252.08 Einsteinium	98	Fm 100 257.10 Fermium	99	Md 101 (257) Mendelevium	100	No 102 259.10 Nobelium	101	Lr 103 262.11 Lawrencium

ALKALI METALS

ALKALI EARTH METALS

LANTHANIDES

ACTINIDES

HALOGENS

NOBLE GASES