



7. What is the formula of the compound formed between the ions  $\text{Co}^{3+}$  and  $\text{O}^{2-}$  ?  
1)  $\text{CoO}$       2)  $\text{Co}_2\text{O}$       3)  $\text{Co}_2\text{O}_3$       4)  $\text{Co}_3\text{O}_2$       5)  $\text{CoO}_2$
8. What is the formula of the compound formed between the ions  $\text{Co}^{2+}$  and  $\text{CN}^-$ ?  
1)  $\text{CoCN}$       2)  $\text{Co}_2\text{CN}$       3)  $\text{Co}_2(\text{CN})_3$       4)  $\text{Co}_3(\text{CN})_2$       5)  $\text{Co}(\text{CN})_2$
9. Which of the following is *not* an ionic compound?  
1)  $\text{Ca}(\text{CH}_3\text{CO}_2)_2$     2)  $\text{NaCN}$       3)  $\text{CrO}$       4)  $\text{NO}_2$       5)  $\text{AgCl}$
10. What is the formula for the **hydrogen phosphate** ion ?  
1)  $\text{H}_3\text{PO}_4$       2)  $\text{HPO}_4^{2-}$       3)  $\text{H}_2\text{PO}_4^-$       4)  $\text{H}_3\text{P}^-$       5)  $\text{HP}^{2-}$
11. What is the molar mass of **sulfur dioxide**?  
1) 64 g/mol      2) 32 g/mol      3) 96 g/mol      4) 16 g/mol      5) 128 g/mol
12. Which of the following is a valid empirical formula?  
1)  $\text{FeCl}_2$       2)  $\text{Fe}_2\text{Cl}_2$       3)  $\text{Fe}_4\text{Cl}_6$       4)  $\text{Fe}_6\text{Cl}_4$       5)  $\text{Fe}_4\text{Cl}_2$

13. A sample of cinnamaldehyde,  $\text{C}_9\text{H}_8\text{O}$ , contains 0.104 mol of the compound. What is the mass of this sample, in grams?
- 1) 3.02 g      2) 13.7 g      3) 27.4 g      4) 0.0730 g      5) 132 g
14. What is the (mass) percent composition of C in  $\text{C}_9\text{H}_8\text{O}$ ?
- 1) 9%      2) 50%      3) 61.2%      4) 81.8%      5) 30.6%
15. Ethylene glycol,  $\text{C}_2\text{H}_6\text{O}_2$ , is an ingredient in automobile antifreeze. Its density is  $1.11 \text{ g/cm}^3$  at  $20^\circ\text{C}$ . If you need exactly 500 mL of ethylene glycol, what mass of the compound, in grams, is required?
- 1) 555 g      2) 450 g      3) 1.80 g      4) 62.0 g      5) 68.6 g

16. You've decided you don't like Chemistry after all and have decided to travel Europe instead. You're driving a rental car through France and see petrol selling at 0.61 euros per liter.

0.88 euro = 1.0 US dollar 4.546 liters = 1 gallon
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How much does petrol cost in U.S. dollars per gallon?

- 1) \$2.77/gal    2) \$0.69/gal    3) \$2.44/gal    4) \$3.15/gal    5) \$4.72/gal
17. Which radiation below has the longest wavelength (don't use your calculator!)?
- 1) blue light ( $6.8 \times 10^{14}$  Hz)                      4) microwaves ( $2.4 \times 10^9$  Hz)  
2) green light ( $6.0 \times 10^{14}$  Hz)                      5) x-rays ( $5.0 \times 10^{12}$  Hz)  
3) red light ( $4.5 \times 10^{14}$  Hz)
18. Which radiation below has the lowest energy (don't use your calculator!)?
- 1) blue light ( $6.8 \times 10^{14}$  Hz)                      4) microwaves ( $2.4 \times 10^9$  Hz)  
2) green light ( $6.0 \times 10^{14}$  Hz)                      5) x-rays ( $5.0 \times 10^{12}$  Hz)  
3) red light ( $4.5 \times 10^{14}$  Hz)
19. What is the wavelength of visible light with frequency  $6.00 \times 10^{14}$  Hz?
- 1) 614 nm    2) 300 nm    3) 500 nm    4) 162 nm    5) 280 nm
20. What is the catalog number for this class?
- 1) 241            2) 111            3) 222            4) 3.14159            5) 68.6 g

## PERIODIC TABLE OF THE ELEMENTS

1A	2A	3B	4B	5B	6B	7B	8B	8B	8B	1B	2B	3A	4A	5A	6A	7A	8A
1 <b>H</b> 1.008																	2 <b>He</b> 4.003
3 <b>Li</b> 6.939	4 <b>Be</b> 9.012											5 <b>B</b> 10.81	6 <b>C</b> 12.01	7 <b>N</b> 14.01	8 <b>O</b> 16.00	9 <b>F</b> 19.00	10 <b>Ne</b> 20.18
11 <b>Na</b> 22.99	12 <b>Mg</b> 24.31											13 <b>Al</b> 26.98	14 <b>Si</b> 28.09	15 <b>P</b> 30.97	16 <b>S</b> 32.07	17 <b>Cl</b> 35.45	18 <b>Ar</b> 39.95
19 <b>K</b> 39.10	20 <b>Ca</b> 40.08	21 <b>Sc</b> 44.96	22 <b>Ti</b> 47.90	23 <b>V</b> 50.94	24 <b>Cr</b> 52.00	25 <b>Mn</b> 54.94	26 <b>Fe</b> 55.85	27 <b>Co</b> 58.93	28 <b>Ni</b> 58.71	29 <b>Cu</b> 63.55	30 <b>Zn</b> 65.39	31 <b>Ga</b> 69.72	32 <b>Ge</b> 72.61	33 <b>As</b> 74.92	34 <b>Se</b> 78.96	35 <b>Br</b> 79.90	36 <b>Kr</b> 83.80
37 <b>Rb</b> 85.47	38 <b>Sr</b> 87.62	39 <b>Y</b> 88.91	40 <b>Zr</b> 91.22	41 <b>Nb</b> 92.91	42 <b>Mo</b> 95.94	43 <b>Tc</b> (99)	44 <b>Ru</b> 101.1	45 <b>Rh</b> 102.9	46 <b>Pd</b> 106.4	47 <b>Ag</b> 107.9	48 <b>Cd</b> 112.4	49 <b>In</b> 114.8	50 <b>Sn</b> 118.7	51 <b>Sb</b> 121.8	52 <b>Te</b> 127.6	53 <b>I</b> 126.9	54 <b>Xe</b> 131.3
55 <b>Cs</b> 132.9	56 <b>Ba</b> 137.3	57 <b>La</b> 138.9	72 <b>Hf</b> 178.5	73 <b>Ta</b> 181.0	74 <b>W</b> 183.8	75 <b>Re</b> 186.2	76 <b>Os</b> 190.2	77 <b>Ir</b> 192.2	78 <b>Pt</b> 195.1	79 <b>Au</b> 197.0	80 <b>Hg</b> 200.6	81 <b>Tl</b> 204.4	82 <b>Pb</b> 207.2	83 <b>Bi</b> 209.0	84 <b>Po</b> (209)	85 <b>At</b> (210)	86 <b>Rn</b> (222)
87 <b>Fr</b> (223)	88 <b>Ra</b> 226.0	89 <b>Ac</b> 227.0	104 <b>Unq</b> (261)	105 <b>Unp</b> (262)	106 <b>Unh</b> (263)	107 <b>Uns</b> (262)	108 <b>Uno</b> (265)	109 <b>Une</b> (266)									

58 <b>Ce</b> 140.1	59 <b>Pr</b> 140.9	60 <b>Nd</b> 144.2	61 <b>Pm</b> (145)	62 <b>Sm</b> 150.4	63 <b>Eu</b> 152.0	64 <b>Gd</b> 157.3	65 <b>Tb</b> 158.9	66 <b>Dy</b> 162.5	67 <b>Ho</b> 164.9	68 <b>Er</b> 167.3	69 <b>Tm</b> 168.9	70 <b>Yb</b> 173.0	71 <b>Lu</b> 175.0
90 <b>Th</b> 232.0	91 <b>Pa</b> 231.0	92 <b>U</b> 238.0	93 <b>Np</b> 237.0	94 <b>Pu</b> (244)	95 <b>Am</b> (243)	96 <b>Cm</b> (247)	97 <b>Bk</b> (249)	98 <b>Cf</b> (251)	99 <b>Es</b> (252)	100 <b>Fm</b> (257)	101 <b>Md</b> (258)	102 <b>No</b> (259)	103 <b>Lr</b> (260)