AKCS
Purrrfect Chemistry

2049 FCC CHEMISTRY Practice

FINAL EXAMINATION #2

The First Rule of ACS Final Exam is "DO NOT WRITE ON EXAM BOOKLET"

Prepared by the Fresno City College Faculty Practice Examination Task Force

FCC EXAMINATIONS TASK FORCE

Lewis L Lemming, **Chair**, *Fresno City College,* Fresno, CA

Mill E. Mole, *Fresno City College*, Fresno, CA
Nick L Mole, *CSU Fresno*, Fresno, CA (retired)
E.A. Poe Cat, *Feline Community College*, Clovis, CA
Pete T. Cat, *Mouse Hunt City College*, Fresno, CA
Firefly V. Horse, *Bitey University*, Coursegold, CA

DIRECTIONS TO THE EXAMINER

This test is designed to be taken with an answer sheet on which the student records his or her responses. All answers are to be marked on that sheet, not written in the booklet. Each student should be provided with an answer sheet and scratch paper, both of which must be turned in with the test booklet at the end of the examination. Each Local Section may use an answer sheet of its own choice.

The full examination consists of 20 multiple-choice questions representing a fairly wide range of difficulty. Students should be permitted to use non-programmable calculators. A periodic table and other useful information are provided on page two of this exam booklet for student reference.

Suggested Time: 20 questions—18 minutes

DIRECTIONS TO THE EXAMINEE

DO NOT TURN THE PAGE UNTIL DIRECTED TO DO SO.

This is a multiple-choice examination with four choices for each question. There is only one correct or best answer to each question. When you select your choice, blacken the corresponding space on the answer sheet with your pencil. Make a heavy full mark, but no stray marks. If you decide to change your answer, be certain to erase your original answer completely.

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ABBREVIATIONS AND SYMBOLS					
amount of substance	n	Faraday constant	F	molar mass	M
ampere	A	free energy	G	mole	mol
atmosphere	atm	frequency	ν	Planck's constant	h
atomic mass unit	u	gas constant	R	pressure	P
Avogadro constant	N_A	gram	g	rate constant	k
Celsius temperature	°C	hour	h	reaction quotient	Q
centi– prefix	c	joule	J	second	s
coulomb	C	kelvin	K	speed of light	c
density	d	kilo– prefix	k	temperature, K	T
electromotive force	E	liter	L	time	t
energy of activation	E_a	measure of pressure	mm Hg	vapor pressure	VP
enthalpy	H	milli– prefix	m	volt	V
entropy	S	molal	m	volume	V
equilibrium constant	K	molar	M		

CONSTANTS
$R = 8.314\ \text{J·mol}^{-1}\text{•K}^{-1}$
$R = 0.0821\ \text{L·atm·mol}^{-1}\text{•K}^{-1}$
$1\ F = 96{,}500\ \text{C•mol}^{-1}$
$1\ F = 96{,}500\ \text{J·V}^{-1}\text{•mol}^{-1}$
$N_A = 6.022 \times 10^{23}\ \text{mol}^{-1}$
$h = 6.626 \times 10^{-34}\ \text{J•s}$
$c = 2.998 \times 10^{8}\ \text{m•s}^{-1}$
0 °C = 273.15 K

PERIODIC TABLE OF THE ELEMENTS

1 1A																	18 8A
1 **H** 1.008	2 2A											13 3A	14 4A	15 5A	16 6A	17 7A	2 **He** 4.003
3 **Li** 6.941	4 **Be** 9.012											5 **B** 10.81	6 **C** 12.01	7 **N** 14.01	8 **O** 16.00	9 **F** 19.00	10 **Ne** 20.18
11 **Na** 22.99	12 **Mg** 24.31	3 3B	4 4B	5 5B	6 6B	7 7B	8 8B	9 8B	10 8B	11 1B	12 2B	13 **Al** 26.98	14 **Si** 28.09	15 **P** 30.97	16 **S** 32.07	17 **Cl** 35.45	18 **Ar** 39.95
19 **K** 39.10	20 **Ca** 40.08	21 **Sc** 44.96	22 **Ti** 47.88	23 **V** 50.94	24 **Cr** 52.00	25 **Mn** 54.94	26 **Fe** 55.85	27 **Co** 58.93	28 **Ni** 58.69	29 **Cu** 63.55	30 **Zn** 65.39	31 **Ga** 69.72	32 **Ge** 72.61	33 **As** 74.92	34 **Se** 78.96	35 **Br** 79.90	36 **Kr** 83.80
37 **Rb** 85.47	38 **Sr** 87.62	39 **Y** 88.91	40 **Zr** 91.22	41 **Nb** 92.91	42 **Mo** 95.94	43 **Tc** (98)	44 **Ru** 101.1	45 **Rh** 102.9	46 **Pd** 106.4	47 **Ag** 107.9	48 **Cd** 112.4	49 **In** 114.8	50 **Sn** 118.7	51 **Sb** 121.8	52 **Te** 127.6	53 **I** 126.9	54 **Xe** 131.3
55 **Cs** 132.9	56 **Ba** 137.3	57 **La** 138.9	72 **Hf** 178.5	73 **Ta** 180.9	74 **W** 183.8	75 **Re** 186.2	76 **Os** 190.2	77 **Ir** 192.2	78 **Pt** 195.1	79 **Au** 197.0	80 **Hg** 200.6	81 **Tl** 204.4	82 **Pb** 207.2	83 **Bi** 209.0	84 **Po** (209)	85 **At** (210)	86 **Rn** (222)
87 **Fr** (223)	88 **Ra** (226)	89 **Ac** (227)	104 **Rf** (261)	105 **Db** (262)	106 **Sg** (266)	107 **Bh** (264)	108 **Hs** (277)	109 **Mt** (268)	110 **Ds** (281)	111 **Rg** (272)	112 **Cn** (277)	113 (Uut)	114 (Uuq)	115 (Uup)	116 (Uuh)	117 (Uus)	118 (Uuo)

58 **Ce** 140.1	59 **Pr** 140.9	60 **Nd** 144.2	61 **Pm** (145)	62 **Sm** 150.4	63 **Eu** 152.0	64 **Gd** 157.3	65 **Tb** 158.9	66 **Dy** 162.5	67 **Ho** 164.9	68 **Er** 167.3	69 **Tm** 168.9	70 **Yb** 173.0	71 **Lu** 175.0
90 **Th** 232.0	91 **Pa** 231.0	92 **U** 238.0	93 **Np** (237)	94 **Pu** (244)	95 **Am** (243)	96 **Cm** (247)	97 **Bk** (247)	98 **Cf** (251)	99 **Es** (252)	100 **Fm** (257)	101 **Md** (258)	102 **No** (259)	103 **Lr** (262)

DIRECTIONS

- When you have selected your answer to each question, blacken the corresponding space on the answer sheet using a soft, #2 pencil. Make a heavy, full mark, but no stray marks. If you decide to change an answer, erase the unwanted mark very carefully.
- There is only one correct answer to each question. Any questions for which more than one response has been blackened will not be counted
- Your score is based solely on the number of questions you answer correctly. It is to your advantage to answer every question.

CHEMISTRY TEST PARTS A and B

1. Add 7.77 g to 11.666 g and round the answer to the appropriate place.
   A) 19.43 g B) 19.436 g
   C) 19.44 g D) 19.0 g

2. How many significant digits are in the length measurement 10.50 cm?
   A) 1 B) 2 C) 3 D) 4

3. A block has a mass of 124.7 g with a volume of 25.0 cm^3 . What is the block's density?
   A) 0.498 g/cm^3 B) 4.99 g/cm^3
   C) 3117.5 g/cm^3 D) 50 g/cm^3

4. What quantity is expressed by the metric unit kilogram?
   A) time B) mass
   C) volume D) length

5. The density of ether is 0.714 g/mL. What is the mass of 10.0 mL of ether?
   A) 0.0714 g B) 71.4 g
   C) 7.14 g D) 1.40 g

6. Liquid xenon boils at 166 K. What is the boiling point on the Celsius scale?
   A) 439 °C B) –439 °C
   C) 107°C D) –107°C

7. Refer to a periodic table and predict which of the following is a metal.
   A) Sb B) Ge
   C) Na D) all of the above

8. Using atomic notation, indicate the isotope having 11 p^+, 12 n^0, and 11 e^-.
   A) $^{12}_{11}Mg$ B) $^{12}_{11}Na$
   C) $^{23}_{12}Na$ D) $^{23}_{11}Na$

9. Lithium occurs naturally as ^6Li and ^7Li. Which isotope is more abundant? (Hint: Refer to the Periodic Table.)
   A) lithium–7 B) lithium–6
   C) lithium–3 D) lithium–4

10. Which of the following elements has the largest atomic radius?
    A) Li B) Na
    C) Mg D) H

11. Which of the following has chemical properties most similar to zinc?
    A) Ga B) Ag
    C) Cd D) Cu

12. What is the core notation for the electron configuration of an aluminum atom?
    A) [Ne] $3s^2\ 3p^1$ B) [Ne] $2s^2\ 2p^1$
    C) [Ne] D) [Ne] $3s^2\ 3d^1$

13. Predict the number of valence electrons for a Group IIA/2 element.
    A) 3 B) 1 C) 2 D) 8

14. The NH_4^+ ion is classified as which of the following?
    A) monoatomic cation
    B) monoatomic anion
    C) polyatomic cation
    D) polyatomic anion

15. How many atoms of copper are in 2.50 mol Cu metal?
    A) 2.41×10^{24} atoms
    B) 2.41×10^{23} atoms
    C) 1.51×10^{24} atoms
    D) $1.5l \times 10^{22}$ atoms

16. What is the chemical formula for cobalt(II) bromide?
    A) Co_2Br B) Co_2Br_3
    C) Co_3Br_2 D) $CoBr_2$

17. Which of the following is the strongest intermolecular force between water molecules?
    A) dipole dipole forces
    B) hydrogen bond
    C) dispersion forces
    D) polar covalent bond

18. What is the mass of 0.0747 moles of gold, Au?
    A) 0.0679 g B) 13.3 g
    C) 0.0748 g D) 14.7 g

19. If the pressure of 50.0 mL of oxygen gas increases from 735 mm Hg to 925 mm Hg, what is the final volume? (Assume temperature remains constant.)
    A) 50.0 mL B) 62.9 mL
    C) 39.7 mL D) 48.4 mL

20. What is the chemical formula for the acetate ion?
    A) HCO_3^{2-} B) $C_2H_3O_2^-$
    C) HCO_3^- D) $C_2H_3O_2^{2-}$

Grade yoursel fusing the answer key below. Compare your number correct to the curve below to get your approximate score.

16 or more correct = A
14 or more correct = B
11 or more correct = C
8 or more correct = D

1. C 11. C
2. D 12. A
3. B 13. C
4. B 14. C
5. C 15. C
6. D 16. D
7. C 17. B
8. D 18. D
9. A 19. C
10. B 20. B