AKCS
Purrrfect Chemistry

2049 FCC CHEMISTRY Practice

FINAL EXAMINATION

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

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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.**

1. A student is asked to precisely dispense 24.70 mL of a solution. Which item glassware could be used for this task?

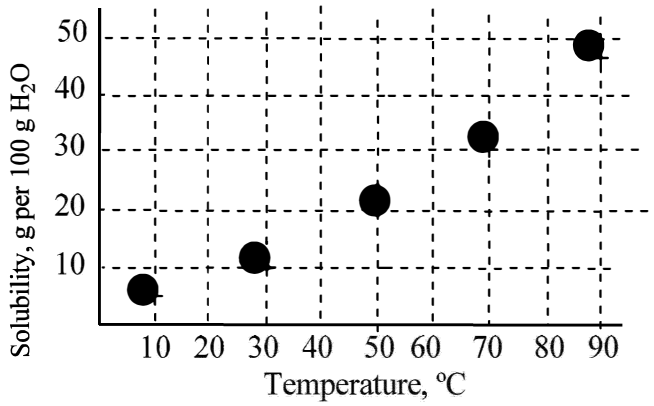
(A) 50 mL beaker

(B) 50 mL buret

(C) 50 mL Erlenmeyer flask

(D) 50 mL graduated cylinder

2. The solubility of $KClO_3$ at several temperatures is shown in the accompanying diagram.



If a student mixes 10.0 g of $KClO_3$ with 45.0 g of H_2O at 70 ° C. Which statement about the final solution is correct?

(A) It is a saturated solution.

(B) It is a supersaturated solution.

(C) It is an unsaturated solution.

(D) It is impossible to determine.

3. Cigarette lighters are generally filled with butane. When butane burns in air, heat is given off to the surroundings. Which of the following is true?

(A) The reaction is endothermic.

(B) The reaction is exothermic.

(C) The reaction is a precipitation reaction.

(D) The reaction is an acid-base reaction.

4. The phase transition from solid to liquid is called

(A) condensation. **(B)** evaporation.

(C) melting/fusion. **(D)** sublimation.

5. In the Lewis structure for NH_3, how many lone pairs of electrons are there?

(A) 0 **(B)** 1 **(C)** 2 **(D)** 4

6. What is the concentration of nitric acid in a solution made by diluting 100 mL of a 0.200 M HNO_3 solution to a final volume of 200 mL?

(A) 0.133 M **(B)** 0.150 M

(C) 0.167 M **(D)** 0.100 M

7. Typical grocery store bags are made of polyethylene, which are linked molecules of ethylene (C_2H_4). If a bag weighs 12.4 g. How many molecules of ethylene (C2H4) are in this bag?

(A) 1.36×10^{24} **(B)** 6.02×10^{23}

(C) 5.33×10^{23} **(D)** 2.67×10^{23}

8. A sulfide ion (S^{2-}) contains?

(A) 16 electrons **(B)** 32 protons

(C) 32 neutrons **(D)** 18 electrons

9. What is the oxidation number of Chromium in $Cr(SO_4)_2$?

(A) +1 **(B)** +2 **(C)** +4 **(D)** +6

10. How many Liters is 122 mL?

(A) 0.122 L **(B)** 1.22×10^{5} L

(C) 1.22 L **(D)** 1.22×10^{-3} L

11. How many protons and neutrons are in ^{59}Ni?

(A) 59 protons and 47 neutrons

(B) 28 protons and 59 neutrons

(C) 59 protons and 28 neutrons

(D) 28 protons and 31 neutrons

12. For the following reaction at equilibrium, addition of CO(g) would cause ___.

$$CO(g) + 2\ H2(g) \rightleftharpoons CH3OH(g)$$

(A) a shift left (more reactants formed).
(B) a shift right (more products formed).
(C) No change.
(D) The reaction to slow down.

13. What volume of a 1.50 M KOH solution would contain 0.750 moles of potassium?

(A) 2 L
(B) 0.250 L
(C) 500 mL
(D) 1 gal

14. Put the following in order of increasing strength of intermolecular forces

$CO,\quad CH_3OH,\quad H_2$

(A) $CO < CH_3OH < H_2$
(B) $CH_3OH < H_2 < CO$
(C) $H_2 < CO < CH_3OH$
(D) $CO < H_2 < CH_3OH$

15. What is the molecular shape of phophorus in PH_3?

(A) tetrahedral
(B) trigonal planar
(C) trigonal pyramidal
(D) linear

16. What is the correct formula for Iron (III) Oxide?

(A) Fe_3O
(B) Fe_2O_3
(C) Fe_3O_2
(D) FeO

17. Which of the following is the ground state electron configuration of a magnesium atom?

(A) $1s^2 2s^2 2p^6$
(B) $1s^2 2s^2 2p^6 3s^2$
(C) $2p^6 3s^1$
(D) $1s^2 2s_2 2p^6 3s^2 4s^1$

18. A sample of oxygen gas has a pressure of 1.05 atm and a volume of 22 L. What pressure would be required to compress the gas to 9.0 L?

(A) 2.6 atm
(B) 11.6 atm
(C) 0.43 atm
(D) 297 torr

19. How many significant digits are in 0.0219 g ?
(A) 2
(B) 3
(C) 4
(D) 5

20. What insoluble product would be formed by the following reaction?

$$(NH_4)_2S(aq) + Pb(NO_3)_2(aq) \rightarrow$$

(A) N_2H_8 (s)
(B) $(NH_4)_2(NO_3)_2$ (s)
(C) PbS (s)
(D) All products are soluble

Grade yourself using the answer key in the footer. 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

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