

First



21
21
V. Ezzamel

Birzeit University
Chemistry Department
Chemistry 141

First Hour Exam

1st Sem. 2012-2013

Time: 70 min.

● Student Name: Rahaf Rimawi

● Student No: 1120125

● Instructor Name: Dr. Hijazi Abu Ali

● Section No: -----

Important note: There are (21) equally graded questions, please answer all of them.

E	D	C	B	A	Q
			X		1
	X				2
		X			3
		X			4
			X		5
			X		6
	X				7
			X		8
			X	X	9
			X	X	10
				X	11
				X	12
	X				13
X					14
	X				15
		X			16
X					17
				X	18
X					19
		X			20
			X		21

GOOD LUCK

Student Name: Rahaf Rimawi Student No: 1120125

Please read each question carefully before you answer, and choose the best correct answer

1. Which one is a physical property of sodium?

- A) Its surface turns black when first exposed to air.
B) It is a solid at 25 °C and changes to a liquid when heated to 98 °C.
C) When placed in water it sizzles and a gas is formed.
D) When placed in contact with chlorine it forms a compound that melts at 801 °C.
E) Sodium is never found as the pure metal in nature.

2. During the swing of a frictionless pendulum, what energy form(s) remain constant?

- A) kinetic energy only
B) potential energy only
C) both kinetic energy and potential energy
D) kinetic plus potential energy
E) None of these forms remains constant.

3. Which of the following represents the largest volume?

- A) 10,000 μL 10^{-2} L B) 1000 pL 10^{-12} L C) 100 mL 10^{-1} L D) 10 nL 10^{-9} L E) 10 cm^3 10^{-2} L

4. Isopropyl alcohol boils at 180.7 °F. What is the boiling point in kelvins?

- A) 387.6 K B) 323.6 K C) 355.6 K D) 190.8 K E) -190.8 K

5. Express 96342 m using 2 significant figures.

- A) $9.60 \times 10^4 \text{ m}$ B) $9.6 \times 10^4 \text{ m}$ C) $9.60 \times 10^{-4} \text{ m}$ D) $9.6 \times 10^{-4} \text{ m}$ E) 96000. m

6. Choose the response that includes all the items listed below that are pure substances.

i. orange juice ii. steam iii. ocean water iv. oxygen v. vegetable soup*

- A) i, iii, v B) ii, iv C) i, iii, iv D) iv only E) all of them are pure

7. Which of the following ions occurs commonly?

- A) P^{3+} B) Br^{7+} C) O^{6+} D) Ca^{2+} E) K^-

8. The correct name of MnSO_4 is:

- A) manganese disulfate B) manganese(II) sulfate C) manganese(IV) sulfate
D) manganese sulfate E) manganese(I) sulfate

9. What is the formula for lead(II) oxide?

- A) PbO B) PbO_2 C) Pb_2O D) PbO_4 E) Pb_2O_3

Student Name: Rahaf Rimawi Student No: 1120125

10. What is the name of the acid formed when HClO_4 liquid is dissolved in water?

- A) hydrochloric acid
B) perchloric acid
C) chloric acid
D) chlorous acid
E) hydrochlorate acid

11. Determine the molecular mass of iron(III) bromide hexahydrate.

- A) 403.65 g
B) 355.54 g
C) 317.61 g
D) 313.57 g
E) 295.56 g

12. Rutherford's experiment with alpha particle scattering by gold foil established that:

- A) protons are not evenly distributed throughout an atom.
B) electrons have a negative charge.
C) electrons have a positive charge.
D) atoms are made of protons, neutrons, and electrons.
E) protons are 1840 times heavier than electrons.

13. A phosphide ion has:

- A) 10 p and 13 e
B) 12 p and 15 e
C) 15 p and 15 e
D) 15 p and 18 e
E) 18 p and 21 e

14. Calculate the number of moles in 38.7 g of phosphorus pentachloride.

- A) 5.38 mol
B) 3.55 mol
C) 0.583 mol
D) 0.282 mol
E) 0.186 mol

15. Calculate the number of chromium atoms in 78.82 g of $\text{K}_2\text{Cr}_2\text{O}_7$.

- A) 9.490×10^{25} Cr atoms
B) 2.248×10^{24} Cr atoms
C) 1.124×10^{24} Cr atoms
D) 3.227×10^{23} Cr atoms
E) 1.613×10^{23} Cr atoms

16. Calculate the mass in grams of 3.65×10^{20} molecules of SO_3 .

- A) 6.06×10^{-4} g
B) 2.91×10^{-2} g
C) 4.85×10^{-2} g
D) 20.6 g
E) 1650 g

17. When 0.6943 g of terephthalic acid was subjected to combustion analysis it produced 1.471 g CO_2 and 0.226 g H_2O . If its molar mass is between 158 and 167 g/mol, what is its molecular formula?

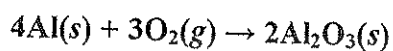
- A) $\text{C}_4\text{H}_6\text{O}_7$
B) $\text{C}_6\text{H}_8\text{O}_5$
C) $\text{C}_7\text{H}_{12}\text{O}_4$
D) $\text{C}_4\text{H}_3\text{O}_2$
E) $\text{C}_8\text{H}_6\text{O}_4$

18. Lead(II) sulfide reacts with hydrogen peroxide to form lead(II) sulfate and water. How many grams of hydrogen peroxide are needed to react completely with 265 g of lead(II) sulfide?

- A) 151 g
B) 123 g
C) 50.3 g
D) 37.7 g
E) 9.41 g

Student Name: _____ Student No: _____

19. Aluminum reacts with oxygen to produce aluminum oxide.



A mixture of 82.49 g of aluminum ($M = 26.98 \text{ g/mol}$) and 117.65 g of oxygen ($M = 32.00 \text{ g/mol}$) is allowed to react. Identify the limiting reactant and determine the mass of the excess reactant present in the vessel when the reaction is complete.

- A) Oxygen is the limiting reactant; 19.81 g of aluminum remain.
- B) Oxygen is the limiting reactant; 35.16 g of aluminum remain.
- C) Aluminum is the limiting reactant; 16.70 g of oxygen remain.
- D) Aluminum is the limiting reactant; 35.16 g of oxygen remain.
- E) Aluminum is the limiting reactant; 44.24 g of oxygen remain.

20. What will be the final volume of a solution prepared by diluting 25 mL of 8.25 M sodium hydroxide to a concentration of 2.40 M?

- A) 330 mL B) 210 mL C) 86 mL D) 60 mL E) 7.3 mL

$$V_1 M_1 = V_2 M_2$$
$$25 \times 8.25 = V_2 \times 2.40$$

21. Which of the following is a true statement.

- A) A mole of one substance has the same number of atoms as a mole of any other substance.
- B) The experimental yield for a reaction is based on the results obtained in the laboratory.
- C) The concentration of a solution is an extensive property, but the amount of solute in a solution is an intensive property.
- D) To prepare 1.00 L of 3.00 M NaCl, weigh 175.5 g of NaCl and dissolve it in 1.00 L of distilled water.

Avogadro's number = 6.022×10^{23}

GOOD LUCK

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BIRZEIT UNIVERSITY
Department of Chemistry
CHEM 141
First Hour Exam
First Semester 2009/2010

Name, ID #: Salam, M. Qansiyeh, 1090641 Discussion Section: 1

THE DURATION OF THE EXAM IS 75 MINUTES

Instructors: Dr. Talal Shahwan (Lecture 1, D5, D6)
Dr. Jack Mustaklem (Lecture 2, D2)
Dr. Zaki A. Hasan (D3, D4, D7)
Dr. Hani Awad (D1)

Q#	a	b	c	d	e	Q#	a	b	c	d	e
1		✓				12			✓		
2			✓			13	✓				
3				✓		14		✓	✍		
4		✓				15	✓	✍			
5		✓				16	✓			✍	
6	✍				✓	17	✓				
7				✓		18					✓
8		✓				19					✓
9			✓			20		✓			
10	✓					Bonus Q				✓	✍
11	✓										

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25

**BIRZEIT UNIVERSITY
CHEMISTRY DEPARTMENT
CHEM. 141 -1st HOUR EXAM**

Spring 2011/2012

TIME: 70 Min

Student Name: ~~.....~~ Student No: ~~.....~~

INSTRUCTOR'S NAME:

Dr. Oraib Sayrafi

Dr. Talal Shahwan (6,7,8)

Discussion: Dr. Hani Awad (4.)

Dr. Zaki Hasan (2,5)

Mr. Adi Qamhiyeh(1,3)

Question	a	b	c	d	e
1		XXXX			
2					
3	XXXX				XXXX
4		XXXX			
5					XXXX
6	XXXX		XXXX		
7			XXXX		
8	XXXX		XXXX		
9	XXXX				
10			XXXX		
11		XXXX			
12		XXXX			
13	XXXX	XXXX			
14	XXXX				
15					
16	XXXX			XXXX	
17					
18				XXXX	
19		XXXX		XXXX	
20	XXXX				
21			XXXX		
22		XXXX	XXXX		
23			XXXX		
24		XXXX	XXXX		
25				XXXX	

Avogadro's number = 6.022×10^{23} .

1. A broad generalization that summarizes and organizes data is called

- a. the scientific method
- b. a scientific law
- c. a scientific theory
- d. a hypothesis
- e. an empirical fact

2. Which one of the following is an extensive property of matter?

- a. density
- b. specific gravity
- c. electrical conductivity
- d. melting point
- e. mass

3. The two major types of pure substances are

- a. compounds and elements
- b. compounds and solutions
- c. elements and mixtures
- d. mixtures and solutions
- e. solutions and elements

4. An example of a chemical compound is

- a. orange juice
- b. brass
- c. bronze
- d. granite
- e. table salt

5. The relative number of atoms of each element in a particular compound

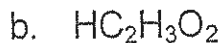
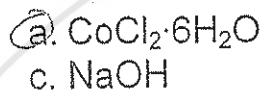
- a. is always 1:1
- b. is the same as the density ratio
- c. is the same as the weight ratio
- d. is definite and constant
- e. cannot be determined experimentally

6. The atomic weight of aluminum is 26.982 u. How many aluminum atoms are there in a 4.55 g sample of aluminum?

- 1 mole $\rightarrow 6.02 \times 10^{23}$
- 4.55 g \rightarrow ??
- $\frac{4.55}{26.982} \times 6.02 \times 10^{23}$
- a. 1.02×10^{23}
 - b. 1.32×10^{23}
 - c. 2.74×10^{24}
 - d. 3.57×10^{24}
 - e. 8.01×10^{23}

7. The kilo is
- unit of mass
 - a unit employed in medical terminology
 - a decimal multiplier in the metric system
 - a unit of speed
 - a volume unit employed by the DEA (drug enforcement agency)

8. Which one of the following compounds is correctly described as a hydrate?



9. The melting point of antimony was listed in one handbook as 1167.3 °F. Expressed in kelvins this temperature would be

$$C = \frac{5}{9} (1167.3 - 32)$$

~~$$360.7 = K + 273$$~~

$$K = 360.7 - 273$$

a. 357.6 K

b. 496.8 K

c. 583.7 K

d. 894.2 K

e. 903.9 K

10. The SI prefixes mega and nano represent, respectively:

a. 10^9 and 10^{-6}

b. 10^{-6} and 10^9

c. 10^6 and 10^{-9}

d. 10^6 and 10^9

e. 10^{-6} and 10^{-9}

11. When a student evaluates the expression,

$$\frac{0.04616^4 \times 0.082057^5 \times 293.30^5}{0.654}$$

$$\begin{array}{r} 1.111 \\ 293.3 \\ \hline 654 \end{array}$$

the result should be expressed as

a. 1.69

b. 1.70

c. 1.699

d. 1.6987

e. 1.69870

12. The number, 0.0030600, is properly expressed in scientific notation

- a. 3.0600×10^{-2} b. 0.30600×10^{-2}
c. 0.306×10^{-2} d. 3.06×10^{-3}
e. 3.0600×10^{-3}

13. A well characterized compound contains potassium, sulfur, and oxygen.

The assay values are: potassium, 49.410%; sulfur, 20.261%.

Determine the empirical formula of this compound.

- a. K_2SO_3 b. K_2SO_4 c. $K_2S_2O_4$
d. $K_2S_2O_3$ e. $K_3S_2O_8$

14. 4.626 gram sample of a hydrocarbon, upon combustion in a combustion analysis apparatus, yielded 6.484 grams of carbon dioxide. The percent, by weight, of carbon in the hydrocarbon is:

- a. 38.25 % b. 19.47 % c. 71.35 %
d. 40.16 % e. 42.16 %

15. In a quantitative analysis study, 2.644 grams of a hydrocarbon (which contains carbon and hydrogen only) sample yielded 8.008 g of CO_2 and

4.098 g of H_2O in a combustion analysis apparatus.

Determine the empirical formula of the hydrocarbon.

- a. CH_3 b. CH_4 c. C_2H_3 d. C_2H_5 e. C_3H_8

16. A compound has an empirical formula CH_2O . An independent analysis gave a value of 150.13 for its molar mass. What is the correct molecular formula?

- a. $C_5H_{10}O_5$ b. $C_6H_{12}O_6$
c. $C_{11}H_{22}O_{11}$ d. $C_6H_6O_8$
e. $C_9H_{10}O_2$

1 → 4
0.3218 → 2

17. Given a chemical reaction, $C_4H_8 + 6O_2 \rightarrow 4CO_2 + 4H_2O$.
If 0.3218 moles of C_4H_8 are allowed to react with 2.000 moles of O_2 , what would be the theoretical yield of water, in moles?

- a. 1.333 moles
b. 1.609 moles
c. 0.6436 moles
d. 1.287 moles
e. 2.574 moles
- $C_4H_8 \quad O$
1. 6
1 6.2

18. Thermal decomposition of $KClO_3(s)$ yields $KCl(s)$ and $O_2(g)$. When 4.289 grams of $KClO_3$ (0.03500 moles) undergo this reaction, how many grams of oxygen are produced?

- a. 1.120 grams
b. 0.5601 grams
c. 2.240 grams
d. 1.680 grams
e. 4.288 grams
- $2 KClO_3 \rightarrow 2KCl + 3O_2$
2 → 3
0.03500 → ??

19. In a chemical reaction, $3C_2H_6O + PCl_3 \rightarrow 3C_2H_5Cl + H_3PO_3$, when the reaction was carried out, the actual yield of C_2H_5Cl was calculated 97.3 % of the theoretical value. If the theoretical yield should have been 2.04 moles, how many grams of C_2H_5Cl were actually obtained?

- a. 123 grams
b. 128 grams
c. 132 grams
d. 135 grams
e. 138 grams
- $\% = \frac{actd}{theo} \times 100$
 $97.3 = \frac{actd}{2.04} \times 100$

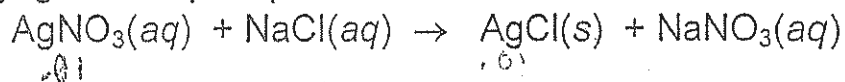
20. 66.7 mL of 18.0 molar sulfuric acid solution was dissolved in enough water to make 500 mL of solution. The molarity of the diluted mixture is

- a. 2.40 molar
b. 0.135 molar
c. 36.0 molar
d. 9.00 molar
e. 0.00741 molar
- $66.7 \times 18 = 1200.6$
 $1200.6 / 500 = 2.40$

21. When the expression, $412.272 + 0.00031 - 1.00797 + 0.000024 + 12.8$ is evaluated, the result should be expressed as

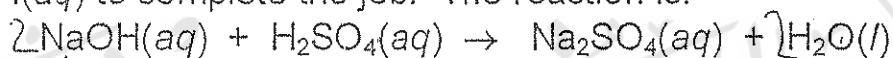
- a. 424
b. 424.0
c. 424.1
d. 424.06
e. 424.064364
- $412.272 + 0.00031 - 1.00797 + 0.000024 + 12.8 = 424.064364$

22. A 50.0 mL sample of 0.200 molar $\text{AgNO}_3(\text{aq})$ was allowed to react with an excess of $\text{NaCl}(\text{aq})$. The AgCl precipitate which resulted from the reaction as shown below was carefully dried and weighed. How many grams of precipitate should be obtained?



- a. 1.08 g
 b. 1.43 g
 c. 1.70 g
 d. 3.13 g
 e. 62.6 g

23. When 25.0 mL of sulfuric acid solution was completely neutralized in a titration with 0.050 molar NaOH solution, it took 18.3 mL of the $\text{NaOH}(\text{aq})$ to complete the job. The reaction is:



What was the molarity of the sulfuric acid solution?

- a. 0.0100
 b. 0.0148
 c. 0.0183
 d. 0.0325
 e. 0.0366

24. A sample of $(\text{N}_2\text{H}_5)_2\text{C}_3\text{H}_4\text{O}_4$ contains 1.084×10^{24} carbon atoms. How many moles of hydrogen atoms are there in the same sample? Avogadro's number = 6.022×10^{23} .

- a. 4.200 moles
 b. 4.725 moles
 c. 7.000 moles
 d. 8.400 moles
 e. 2.400 moles

Handwritten notes for question 24:
 1 mole $\rightarrow 6.02 \times 10^{23}$ atoms
 1.084×10^{24} atoms \rightarrow ? moles
 $\frac{1.084 \times 10^{24}}{6.02 \times 10^{23}} = 1.8$ mole
 3C \rightarrow 1.8 mole
 14H \rightarrow 1.8 mole
 5.4 mole H atoms

25. An empty volumetric flask, weighing 60.42 grams, when filled with water it weighed 309.60 g. After emptying the water and drying the flask, it was filled with ethylene glycol. It now weighed 338.72 grams. What is the specific gravity of the ethylene glycol?

- a. 0.8048 b. 0.9140 c. 1.094 d. 1.1169 e. 1.2424

Handwritten calculations for question 25:
 mass of water = 309.60 g - 60.42 g = 249.18 g
 mass of ethylene glycol = 338.72 g - 60.42 g = 278.3 g
 Specific gravity = $\frac{278.3}{249.18} = 1.117$

PERIODIC TABLE OF THE ELEMENTS^a

IA												Noble gases																									
1	H 1.00794											2	He 4.00260																								
2												0																									
3	Li 6.941	4	Be 9.01218											5	B 10.811	6	C 12.011	7	N 14.00674	8	O 15.9994	9	F 18.99840	10	Ne 20.1797												
11	Na 22.98977	12	Mg 24.3050											13	Al 26.98154	14	Si 28.0855	15	P 30.97376	16	S 32.066	17	Cl 35.4527	18	Ar 39.948												
3		IIIA												IIIA		IVA		VA		VIA		VIIA															
19	K 39.0983	20	Ca 40.078	21	Sc 44.95591	22	Ti 47.88	23	V 50.9415	24	Cr 51.9961	25	Mn 54.9380	26	Fe 55.847	27	Co 58.93320	28	Ni 58.69	29	Cu 63.546	30	Zn 65.39	31	Ga 69.723	32	Ge 72.61	33	As 74.92159	34	Se 78.96	35	Br 79.904	36	Kr 83.80		
4		IIIB		IVB		VB		VIB		VIIB		VIII						IB		IIB																	
37	Rb 85.4678	38	Sr 87.62	39	Y 88.90585	40	Zr 91.224	41	Nb 92.90638	42	Mo 95.94	43	Tc 98.9072	44	Ru 101.07	45	Rh 102.90550	46	Pd 106.42	47	Ag 107.8682	48	Cd 112.411	49	In 114.82	50	Sn 118.710	51	Sb 121.75	52	Te 127.60	53	I 126.90447	54	Xe 131.29		
5		IIIB		IVB		VB		VIB		VIIB		VIII						IB		IIB																	
55	Cs 132.90543	56	Ba 137.327	57	La 138.90549	58	Ce 140.12	59	Pr 140.90765	60	Nd 144.24	61	Pm 144.9127	62	Sm 150.36	63	Eu 151.965	64	Gd 157.25	65	Tb 158.92534	66	Dy 162.50	67	Ho 164.93032	68	Er 167.26	69	Tm 168.93403	70	Yb 173.054	71	Lu 174.967				
6		IIIB		IVB		VB		VIB		VIIB		VIII						IB		IIB																	
87	Fr 223.0197	88	Ra 226.0254	89	Ac 227.0337	90	Th 232.0377	91	Pa 231.036	92	U 238.02891	93	Np 237.04817	94	Pu 244.06422	95	Am 243.06138	96	Cm 247.0712	97	Bk 247.0712	98	Cf 251.0825	99	Es 252.083	100	Fm 257.10	101	Mendelevium 258.10	102	Nobelium 259.10	103	Livermorium 260.10	104	Tennessium 261.10	105	Oganesson 262.10
7		IIIB		IVB		VB		VIB		VIIB		VIII						IB		IIB																	
104	Unq 261.11	105	Unp 262.114	106	Unh 263.118	107	Uns 262.12	108	Uuq 261.11	109	Uup 262.114	110	Uuh 263.118	111	Uus 262.12	112	Uuq 261.11	113	Uup 262.114	114	Uuh 263.118	115	Uus 262.12	116	Uuq 261.11	117	Uup 262.114	118	Uuh 263.118	119	Uus 262.12	120	Uuq 261.11				

^a Atomic masses are the 1985 values given in the Table of Atomic Masses and Atomic Numbers (opposite) but rounded, where appropriate to the fifth decimal place.

58	Ce 140.116	59	Pr 140.90765	60	Nd 144.24	61	Pm 144.9127	62	Sm 150.36	63	Eu 151.965	64	Gd 157.25	65	Tb 158.92534	66	Dy 162.50	67	Ho 164.93032	68	Er 167.26	69	Tm 168.93403	70	Yb 173.054	71	Lu 174.967		
72	Hf 178.49	73	Ta 180.9479	74	W 183.85	75	Re 186.207	76	Os 190.2	77	Ir 192.22	78	Pt 195.08	79	Au 196.96654	80	Hg 200.59	81	Tl 204.3833	82	Pb 207.2	83	Bi 208.98037	84	Po 209	85	At 209	86	Rn 222

Avogadro number = 6.02×10^{23}

Periodic Table of the Elements

1A (1)	2A (2)	3B (3)	4B (4)	5B (5)	6B (6)	7B (7)	8B (8)	9B (9)	10B (10)	11B (11)	12B (12)	3A (13)	4A (14)	5A (15)	6A (16)	7A (17)	8A (18)
1 H 1.008	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	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 65.38	31 Ga 69.72	32 Ge 72.64	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 98.91	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.76	52 Te 127.60	53 I 126.91	54 Xe 131.30
55 Cs 132.91	56 Ba 137.33	57 La 138.91	58 Pr 140.91	59 Nd 144.24	60 Pm 144.91	61 Sm 150.36	62 Eu 151.96	63 Gd 157.25	64 Tb 158.93	65 Dy 162.50	66 Ho 164.93	67 Er 167.26	68 Tm 168.93	69 Yb 173.05	70 Lu 175.04	71 Hf 178.49	72 Ta 180.95
87 Fr (223)	88 Ra (226)	89 Ac (227)	90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np 237.05	94 Pu 244.06	95 Am 243.06	96 Cm 247.07	97 Bk 247.07	98 Cf 251.08	99 Es 252.08	100 Fm 257.10	101 Md 258.10	102 No 259.10	103 Lr 260.10	104 Rf 261.10
107 Boh (263)	108 Hs (265)	109 Mt (268)	110 Ds (271)	111 Rg (272)	112 Cn (285)	113 Nh (286)	114 Fl (289)	115 Mc (290)	116 Lv (293)	117 Ts (294)	118 Og (294)	119 Uue (298)	120 Uub (301)	121 Uut (304)	122 Uuq (307)	123 Uuq (310)	124 Uuq (311)

As of late 2007, elements 112 through 118 have not been named.

6	Lanthanides	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (145)	62 Sm 150.36	63 Eu 151.96	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.05	71 Lu 175.04
7	Actinides	90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np 237.05	94 Pu 244.06	95 Am 243.06	96 Cm 247.07	97 Bk 247.07	98 Cf 251.08	99 Es 252.08	100 Fm 257.10	101 Md 258.10	102 No 259.10	103 Lr 260.10



19

BirZeit University
Chemistry Department
Chemistry 143

First Hour Exam

2nd Sem. 2014/2015

Instructors:

Dr. Hani Awad	(D4)
Dr. Adel Hidmi	(D7)
Dr. Amjad Altaweel	(D1+D10)
Dr. Mohammad Qneibi	(D8)
Dr. Ismael Bedran	(D3)
Mr. Adi Qamhieh	(D2,D9, D5)
Ms. Salam Maloul	(D6)

- **Student Name:** د. سلام مالول
- **Student No:** 1142724.
- **Section No:** القسم الخامس

GOOD LUCK

Student Name محمد صبر

Student number 1142724

1	A	<u>B</u>	C	D	E
2	A	B	C	<u>D</u>	E
3	A	B	C	<u>D</u>	E
4	A	B	<u>C</u>	D	E
5	A	B	C	<u>D</u>	E
6	A	B	C	<u>D</u>	E
7	A	B	C	<u>D</u>	E
8	A	<u>B</u>	C	D	E
9	A	B	C	<u>D</u>	E
10	A	B	<u>C</u>	D	E
11	A	<u>B</u>	C	D	E
12	<u>A</u>	B	C	D	E
13	A	<u>B</u>	C	D	E
14	A	B	C	<u>D</u>	E
15	A	<u>B</u>	C	D	E
16	<u>A</u>	B	C	D	E
17	<u>A</u>	B	C	D	E
18	A	B	C	D	<u>E</u>
19	A	B	<u>C</u>	D	E
20	A	B	<u>C</u>	D	E
21	A	B	<u>C</u>	D	E
22	<u>A</u>	B	C	D	E

1. Which one of the following represents a chemical change?

- A) boiling water to form steam
- B) turning hair yellow with bleach
- C. melting butter
- D. mixing powdered charcoal and oxygen at room temperature
- E. cutting a bar of sodium metal into pieces with a knife

2. How many significant figures does the result of the following sum contain? $8.5201 + 1.93$

- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

3. Rutherford's experiment with alpha particle scattering by gold foil established that

- A) protons are not evenly distributed throughout an atom.
- B) electrons have a negative charge.
- C) electrons have a positive charge.
- D) atoms are made of protons, neutrons, and electrons.
- E) protons are 1840 times heavier than electrons.

4. Give the number of protons (p), electrons (e), and neutrons (n) in one atom of chlorine-37.

- A) 37 p, 37 e, 17 n
- B) 17 p, 17 e, 37 n
- C) 17 p, 17 e, 20 n
- D) 37 p, 17 e, 20 n
- E) 17 p, 37 e, 17 n

5. How many silicon atoms are there in 1.00 g of silicon?

- A) 1 atom
- B) 0.0356 atoms
- C) 2.57×10^{23} atoms
- D) 2.14×10^{22} atoms
- E) 1.75×10^{25} atoms

6. What is the percent CsCl by mass in a 0.711 M (mole/L) CsCl solution that has a density of 1.091 g/mL?

- A) 3.87×10^{-4} %
- B) 3.87×10^{-1} %
- C) 11.0 %
- D) 1.1 %
- E) 6.5×10^{-2} %

g of solute

g of solution

7. The name of HClO_2 is

- A) hydrochloric acid
- B) chloroform
- C) hydrogen dioxychloride
- D) chlorous acid
- E) chloric acid

8. The stock system name for CrSO_3 is:

- A) chromium sulfide
- B) chromium(II) sulfite
- C) chromium(II) sulfate
- D) chromium(III) sulfite
- E) chromium sulfur oxide

9. Write and balance the equation for the combustion of ferrocene, $\text{C}_{10}\text{H}_{10}\text{Fe}$, in oxygen to give iron(III) oxide, carbon dioxide, and water.

- A) $\text{C}_{10}\text{H}_{10}\text{Fe}(s) + \text{O}_2(g) \rightarrow 2 \text{Fe}_2\text{O}_3(s) + 10 \text{CO}_2(g) + 5 \text{H}_2\text{O}(g)$
- B) $\text{C}_{10}\text{H}_{10}\text{Fe}(s) + 13 \text{O}_2(g) \rightarrow \text{FeO}(s) + 10 \text{CO}_2(g) + 5 \text{H}_2\text{O}(g)$
- C) $2 \text{C}_{10}\text{H}_{10}\text{Fe}(s) + 26 \text{O}_2(g) \rightarrow \text{Fe}_2\text{O}_3(s) + 20 \text{CO}_2(g) + 10 \text{H}_2\text{O}(g)$
- D) $4 \text{C}_{10}\text{H}_{10}\text{Fe}(s) + 53 \text{O}_2(g) \rightarrow 2 \text{Fe}_2\text{O}_3(s) + 40 \text{CO}_2(g) + 20 \text{H}_2\text{O}(g)$

10. Hydrazine, N_2H_4 , is an important industrial reagent. It is synthesized by the Raschig process. $2 NaOH + Cl_2 + 2 NH_3 \rightarrow N_2H_4 + 2 NaCl + 2 H_2O$

If you combine 100. g each of NaOH, Cl_2 , and NH_3 , some amount of two of the three reactants will be left when the reaction is complete. The two reactants that are left over are

- A) NaOH and Cl_2 B) NaOH and NH_3 C) Cl_2 and NH_3
D) all of the reactant will be consumed in the reaction.

11. The formula of caffeine is $C_8H_{10}N_4O_2$. Calculate the mass of 1.15×10^{-3} moles of caffeine.

- A) 0.106 g B) 0.223 g C) 1.96×10^{-3} g D) 2.71 g

12. Citric acid, $C_6H_8O_7$, is found in many fruits.

What is the weight percent of carbon in the compound?

- A) 37.5% B) 4.2% C) 58.3% D) 18.8%

13. What volume is occupied by 4.00 grams of carbon dioxide gas at a pressure of 0.976 atm and a temperature of $25.0^\circ C$?

- A) 0.191 L B) 2.28 L C) 19.1 L D) 22.8 L

14. What is the molar mass of an unknown gas if the density of that gas is 0.726 grams/liter at a pressure of 71 mm Hg and a temperature of $25^\circ C$?

- A) 5.71 g/mole B) 15.9 g/mole C) 44.0 g/mole D) 190 g/mole

15. 1.000 atm of oxygen gas, placed in a container having a pinhole opening in its side, leaks from the container 2.14 times faster than does 1.000 atm of an unknown gas placed in this same apparatus. Which of these species could be the unknown gas?

- A) Cl_2 B) SF_6 C) Kr D) UF_6 E) Xe

16. A sample of N_2 is contained in a 255 mL flask at $24^\circ C$; its pressure is 45.6 mm Hg. If the gas is transferred to a 750. mL flask, and the temperature is now $35^\circ C$, what is the pressure of the gas?

- A) 16.1 mm Hg B) 139 mm Hg C) 15.0 mm Hg D) 22.6 mm Hg

17. If equal masses of $O_2(g)$ and $HBr(g)$ are in separate containers of equal volume and temperature, which one of these statements is true?

- A) The pressure in the O_2 container is greater than that in the HBr container.
B) There are more HBr molecules than O_2 molecules.
C) The average velocity of the O_2 molecules is less than that of the HBr molecules.
D) The average kinetic energy of HBr molecules is greater than that of O_2 molecules.
E) The pressures of both gases are the same.

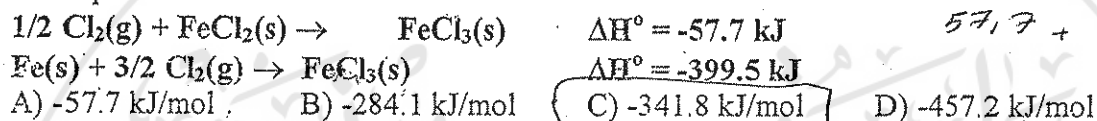
18. A compound contains only calcium and fluorine. A sample of the compound is determined to contain 2.00 g of calcium and 1.90 g of fluorine. According to the Law of Definite Proportions, how much calcium should another sample of this compound contain if it contains 2.85 g of fluorine?

- A) 2.71 g B) 4.50 g C) 4.00 g D) 6.00 g E) 3.00 g

19. When 221 grams of water at a temperature of 25.0 °C is mixed with an unknown mass of water at a temperature of 57.0 °C the final temperature of the resulting mixture is 33.1 °C. What was the mass of the second sample of water?

- A) 29.5 g B) 67.0 g C) 74.9 g D) 131 g

20. Calculate the standard molar enthalpy of formation of FeCl₂(s) using the following standard enthalpies of reaction:



21. When 0.560 g of Na(s) reacts with excess F₂(g) to form NaF(s), 13.8 kJ of heat is evolved at standard-state conditions. What is the standard enthalpy of formation (ΔH_f°) of NaF(s)?

- A) 24.8 kJ/mol D) -7.8 kJ/mol
B) 570 kJ/mol E) -570 kJ/mol
C) -24.8 kJ/mol

22. An exothermic reaction causes the surroundings to

- A) warm up. D) decrease its temperature.
B) become acidic. E) release CO₂.
C) expand.

Excellent
104
100

Birzeit University---Chemistry Department

1st Hr. Exam

Chem. 141

1st. Sem.2013/2014

Time: 20 Minutes

Instructors: Dr. Zaki Hassan (Sections 1 and 2)

Dr. Abdullatif Abuhijleh (Sections 3 and 4)

Dr. Mazen Hamed (Sections 5 and 6)

Student name

Student No.

Student Section

3

Circle the correct answer

1. What is the formula for lithium nitrite?

~~LiNO₂~~

A) LiNO₃

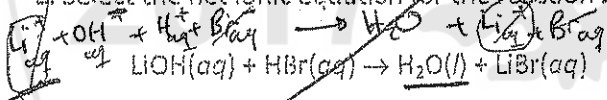
B) Li₂NO₃

C) LiNO₂

D) Li₂NO₂

E) LiNO₄

2. Select the net ionic equation for the reaction between lithium hydroxide and hydrobromic acid.



A) $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l})$

B) $\text{Li}^+(\text{aq}) + \text{OH}^-(\text{aq}) + \text{H}^+(\text{aq}) + \text{Br}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{LiBr}(\text{aq})$

C) $\text{Li}^+(\text{aq}) + \text{Br}^-(\text{aq}) \rightarrow \text{LiBr}(\text{aq})$

D) $\text{HBr}(\text{aq}) \rightarrow \text{H}^+(\text{aq}) + \text{Br}^-(\text{aq})$

E) $\text{LiOH}(\text{aq}) \rightarrow \text{Li}^+(\text{aq}) + \text{OH}^-(\text{aq})$

3. Which of the following is the empirical formula for hexane, C₆H₁₄?

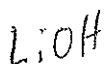
A) CH_{2.3}

B) C₁₂H₂₈

C) C_{0.43}H

D) C₃H₇

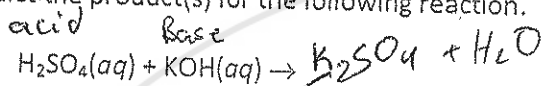
E) C₆H₁₄



4. Lithium hydroxide is used in alkaline batteries. Calculate the molarity of a solution prepared by dissolving 1.495 moles of LiOH in enough water to give a final volume of 750. mL.

- A) 1.99 M B) 1.12 M C) 0.00199 M D) 1.50 M E) 0.502 M

5. Predict the product(s) for the following reaction.



- A) $K(s) + H_2(g) + SO_3(g)$ D) $K_2S(aq) + H_2O(l)$
B) $K_2SO_4(aq) + H_2O(l)$ E) No reaction occurs.
C) $KSO_4(aq) + H_2O(l)$

6. Given that 1 inch = 2.54 cm, 1 cm³ is equal to

- A) 0.155 in³ B) 6.45 in³ C) 0.394 in³ D) 0.0610 in³ E) 16.4 in³

~~1 in~~ $(1 \text{ in})^3 = (2.54)^3 \text{ cm}^3$

7. Silicon has three naturally occurring isotopes, ²⁸Si, ²⁹Si, and ³⁰Si. Use the following data to calculate the atomic mass of silicon.

Isotope	Isotopic Mass (amu)	Abundance %
²⁸ Si	27.976927	92.23
²⁹ Si	28.976495	4.67
³⁰ Si	29.973770	3.10

- A) 28.7260 amu D) 28.9757 amu
B) 27.9801 amu E) 29.2252 amu
C) 28.0855 amu

$$\frac{(244.2 - 32) \times 5}{9}$$

8. Acetic acid boils at 244.2°F. What is its boiling point in degrees Celsius?

- A) 153.4°C B) 382.0°C C) 117.9°C D) 103.7°C E) 167.7°C

9. What is the correct name for MgF₂?

- A) monomagnesium difluoride
B) magnesium(III) fluoride
C) magnesium difluoride
D) magnesium fluoride
E) none of these choices is correct.

10. The sugar, sucrose, has the molecular formula C₁₂H₂₂O₁₁. What is the % of carbon in sucrose, by mass?

- (12)(12) + 22(1) + 11(16)
A) 42.1% B) 52.8% C) 41.4% D) 33.3% E) 26.7%

11. The appropriate number of significant figures in the result of 15.234 - 15.208 is:

- A) 1 B) 2 C) 3 D) 4 E) 5

12. Which one of the following combinations of names and formulas is incorrect?

- A) NaHCO₃ sodium carbonate D) H₃PO₄ phosphoric acid
B) HCl hydrochloric acid E) HNO₃ nitric acid
C) KOH potassium hydroxide

17. Which of the following correctly expresses 0.000007913 g in scientific notation?

- A) 7.913×10^{-5} g
 B) 7.913×10^{-9} g
 C) 7.913×10^5 g
 D) 7.913×10^6 g
 E) 7.913×10^{-6} g

18. Which of the following is a non-metal?

- A) calcium, Ca, Z = 20
 B) sodium, Na, Z = 11
 C) bromine, Br, Z = 35
 D) lithium, Li, Z = 3
 E) lead, Pb, Z = 82

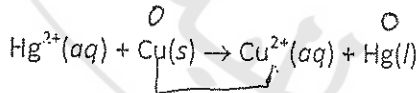
19. Determine the molecular mass of iron (III) bromide hexahydrate.

- A) 317.61 amu
 B) 295.56 amu
 C) 355.54 amu
 D) 403.65 amu
 E) 313.57 amu

20. Calculate the oxidation number of the chlorine in perchloric acid, HClO_4 , a strong oxidizing agent.

- A) -1
 B) +7
 C) +5
 D) +4
 E) None of these is the correct oxidation number.

21. Identify the reducing agent in the following redox reaction.

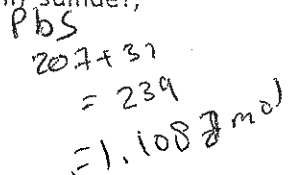
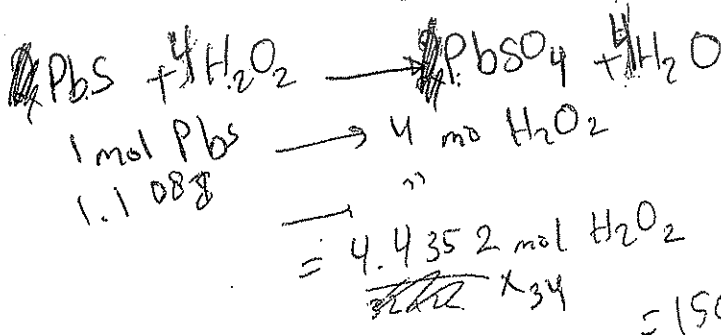


- A) $\text{Hg}^{2+}(\text{aq})$ and $\text{Cu}^{2+}(\text{aq})$
 B) $\text{Cu}^{2+}(\text{aq})$
 C) $\text{Hg}(\text{l})$
 D) $\text{Hg}^{2+}(\text{aq})$
 E) $\text{Cu}(\text{s})$

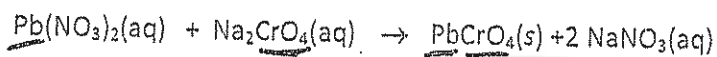
22. Lead(II) sulfide (PbS) reacts with hydrogen peroxide to form lead(II) sulfate and water. How

many grams of hydrogen peroxide are needed to react completely with 265 g of lead(II) sulfide?,

- A) 37.7 g
 B) 9.41 g
 C) 151 g
 D) 123 g
 E) 50.3 g



23. The spectator ions for the reaction of an aqueous solutions of lead nitrate, $\text{Pb}(\text{NO}_3)_2$, with sodium chromate, Na_2CrO_4 , to form a precipitate of lead chromate are :



- A) $\text{CrO}_4^{2-}(\text{aq})$ and $\text{Na}^+(\text{aq})$
 B) $\text{Na}^+(\text{aq})$ and $\text{Pb}^{2+}(\text{aq})$
 C) $\text{Pb}^{2+}(\text{aq})$ and $\text{NO}_3^-(\text{aq})$
 D) $\text{Pb}^{2+}(\text{aq})$ and $\text{CrO}_4^{2-}(\text{aq})$
 E) $\text{Na}^+(\text{aq})$ and $\text{NO}_3^-(\text{aq})$

24. Calculate the number of oxygen atoms in 29.34 g of sodium sulfate, Na_2SO_4 . = 142 g/m

A) 2.409×10^{24} O atoms

B) 1.166×10^{25} O atoms

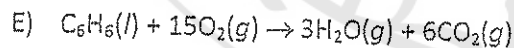
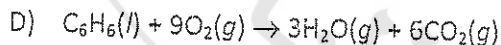
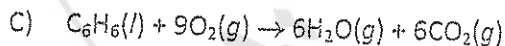
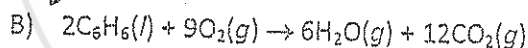
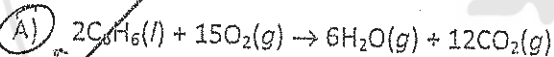
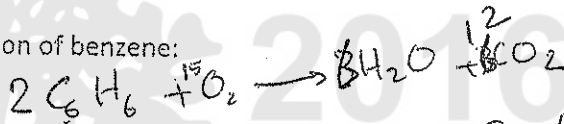
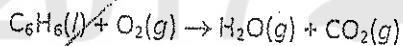
C) 4.976×10^{23} O atoms

D) 1.244×10^{23} O atoms

E) 2.115×10^{24} O atoms

Handwritten calculations for Q24:
 $29.34 \text{ g} \times \frac{1 \text{ mol}}{142 \text{ g}} = 0.2066 \text{ mol}$
 $0.2066 \text{ mol} \times 4 \text{ O atoms} = 0.8264 \text{ mol O}$
 $0.8264 \text{ mol} \times 6.022 \times 10^{23} = 4.976 \times 10^{23}$

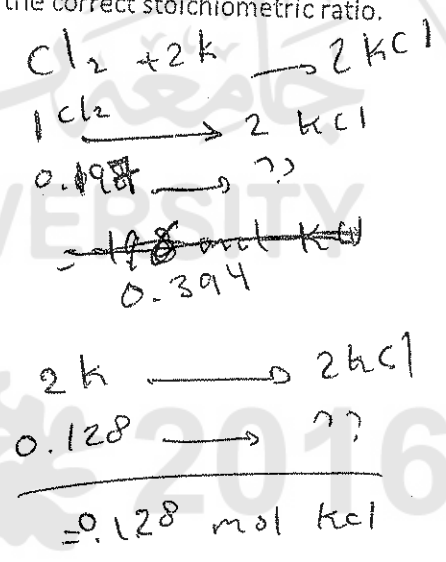
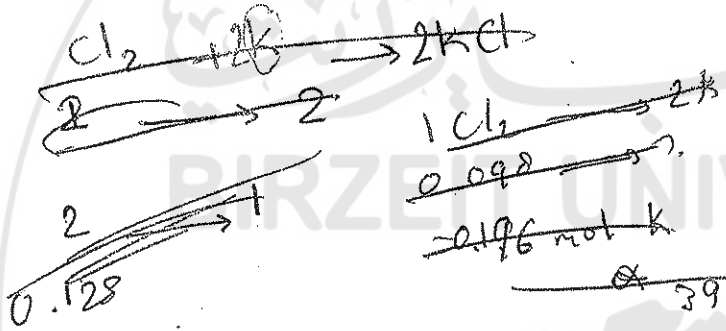
25. Balance the following equation for the combustion of benzene:



26. Identify the limiting reactant and determine the mass of the excess reactant remaining when

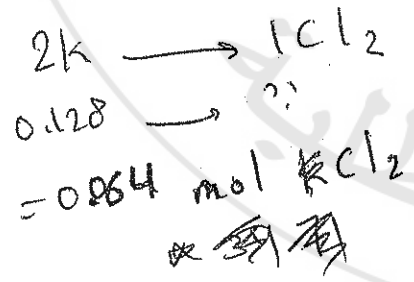
7.00 g of chlorine gas reacts with 5.00 g of potassium to form potassium chloride.

- 7
35.5
~~0.197 mol~~
0.197
- 6
- A) Chlorine is the limiting reactant; 2.70 g of potassium remain.
 B) Chlorine is the limiting reactant; 4.64 g of potassium remain.
 C) Potassium is the limiting reactant; 2.47 g of chlorine remain.
 D) Potassium is the limiting reactant; 7.23 g of chlorine remain.
 E) No limiting reagent; the reactants are present in the correct stoichiometric ratio.



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K is the limiting





Birzeit University
Chemistry Department
Chemistry 141

First Exam

1st Sem. 2012-2013

Student Name: _____

Student No.: _____

Section No.: _____

E	D	C	B	A	
					21
					22
					23
					24
					25
					26

E	D	C	B	A	
					1
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					3
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					20

PERIODIC TABLE OF THE ELEMENTS

<http://www.periodni.com>

GROUP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	1 H 1.0079 Hydrogen	2 He 4.0026 Helium																	
2	3 Li 6.941 Lithium	4 Be 9.0122 Beryllium												5 B 10.811 Boron	6 C 12.011 Carbon	7 N 14.007 Nitrogen	8 O 15.999 Oxygen	9 F 18.998 Fluorine	10 Ne 20.180 Neon
3	11 Na 22.990 Sodium	12 Mg 24.305 Magnesium	13 Al 26.982 Aluminum	14 Si 28.086 Silicon	15 P 30.974 Phosphorus	16 S 32.065 Sulfur	17 Cl 35.453 Chlorine	18 Ar 39.948 Argon											
4	19 K 39.098 Potassium	20 Ca 40.078 Calcium	21 Sc 44.956 Scandium	22 Ti 47.867 Titanium	23 V 50.942 Vanadium	24 Cr 51.996 Chromium	25 Mn 54.938 Manganese	26 Fe 55.845 Iron	27 Co 58.933 Cobalt	28 Ni 58.693 Nickel	29 Cu 63.546 Copper	30 Zn 65.38 Zinc	31 Ga 69.723 Gallium	32 Ge 72.64 Germanium	33 As 74.922 Arsenic	34 Se 78.96 Selenium	35 Br 79.904 Bromine	36 Kr 83.798 Krypton	
5	37 Rb 85.468 Rubidium	38 Sr 87.62 Strontium	39 Y 88.906 Yttrium	40 Zr 91.224 Zirconium	41 Nb 92.906 Niobium	42 Mo 95.96 Molybdenum	43 Tc 98 Technetium	44 Ru 101.07 Ruthenium	45 Rh 102.91 Rhodium	46 Pd 106.42 Palladium	47 Ag 107.87 Silver	48 Cd 112.41 Cadmium	49 In 114.82 Indium	50 Sn 118.71 Tin	51 Sb 121.76 Antimony	52 Te 127.60 Tellurium	53 I 126.90 Iodine	54 Xe 131.29 Xenon	
6	55 Cs 132.91 Cesium	56 Ba 137.33 Barium	57 La-Lu Lanthanide	58 Ce 140.12 Cerium	59 Pr 140.91 Praseodymium	60 Nd 144.24 Neodymium	61 Pm 145 Promethium	62 Sm 150.36 Samarium	63 Eu 151.96 Europium	64 Gd 157.25 Gadolinium	65 Tb 158.93 Terbium	66 Dy 162.50 Dysprosium	67 Ho 164.93 Holmium	68 Er 167.26 Erbium	69 Tm 168.93 Thulium	70 Yb 173.05 Ytterbium	71 Lu 174.97 Lutetium		
7	87 Fr 223 Francium	88 Ra 226 Radium	89 Ac-Lr Actinide	90 Th 232.04 Thorium	91 Pa 231.04 Protactinium	92 U 238.03 Uranium	93 Np 237 Neptunium	94 Pu 244 Plutonium	95 Am 243 Americium	96 Cm 247 Curium	97 Bk 247 Berkelium	98 Cf 251 Californium	99 Es 252 Einsteinium	100 Fm 257 Fermium	101 Md 258 Mendelevium	102 No 259 Nobelium	103 Lr 262 Lawrencium		

Legend for element categories:

- Metal
- Semimetal
- Nonmetal
- Alkali metal
- Alkaline earth metal
- Transition metals
- Lanthanide
- Actinide
- Chalcogens element
- Halogens element
- Noble gas

STANDARD STATE (25 °C; 101 kPa)

- Hg - gas
- Li - liquid
- Tc - synthetic

Legend for element identification:

- GROUP IUPAC
- GROUP CAS
- ATOMIC NUMBER
- SYMBOL
- ELEMENT NAME

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(1) Pure Appl. Chem., 81, No. 11, 2151-2156 (2009)
 Relative atomic masses are expressed with five significant figures. For elements that have no stable nuclides, the value enclosed in brackets indicates the mass number of the longest-lived isotope of the element. However, three such elements (Tl, Pa and U) do have a characteristic terrestrial isotopic composition, and for these an atomic weight is tabulated.

Birzeit University---Chemistry Department

1st Hr. Exam

Chem. 141

1st. Sem.2014/2015

26/10/2014

Time: 80 Minutes

Instructors: Dr. Adil Alhidmeh(section 1)

Mr. Adi Qamhieh (section 2)

Dr. Zaki Hassan (Section 3)

Dr. Abdullatif Abuhijleh (Sections 4)

Student name

Shorouq Odeh

Student No.

1110564

Student Section

1

BIRZEIT UNIVERSITY

3

Circle the correct answer

1. Express 96,342 m using 2 significant figures.

~~A) 9.60 x 10⁴ m~~

~~B) 9.6 x 10⁴ m~~

C) 9.60 x 10⁴ m

D) 9.6 x 10⁴ m

E) 96,000. m

9.6 x 10⁴

2. The area of large pizza is 176.7 in². Given that 1 inch = 2.54 cm, express this area in square centimeters (cm²)

A) 96.8 cm²

B) 448.8 cm²

C) 1140. cm²

D) 69.57 cm²

E) 27.39 cm²

3. The number 6.0448, rounded to 3 decimal places, becomes:

A) 6.045

B) 6.05

C) 6.044

D) 0.60448 x 10³

E) non of the above answers

4. Acetone boils at 56.1°C. What is the boiling point in degrees Fahrenheit?

- A) 159°F B) 133°F C) 101°F D) 69.0°F E) 43.4°F

5. Bromine is the only nonmetal that is a liquid at room temperature. Consider the isotope Bromine 81, $^{81}_{35}\text{Br}$. Select the combination which lists the correct atomic number, neutron number, and mass number, respectively.

- A) 35, 46, 81 B) 35, 81, 46
 C) 81, 46, 35 D) 46, 81, 35
E) 35, 81, 116

6. Which of the following compounds is ionic?

- A) PF_3 B) CS_2 C) CH_4 D) SO_2 E) MgCl_2

7. Which of the following gives the formula and the bonding for sodium oxide?

- A) NaO , ionic compound D) Na_2O , ionic compound
B) NaO , covalent compound E) Na_2O_2 , ionic compound
C) Na_2O , covalent compound

8. The compound, NaH_2PO_4 , is present in many baking powders. What is its name?

- A) sodium biphosphate D) sodium hydrophosphate Na_2HPO_4
B) sodium hydrogen phosphate Na_2HPO_4 E) sodium dihydride phosphate
 C) sodium dihydrogen phosphate

9. What is the formula for Fe(III) oxide?

- A) FeO B) Fe_2O C) FeO_3 D) Fe_2O_5 E) Fe_2O_3

10. What is the name of PCl_3

- A) phosphorus chloride D) phosphorus trichloride
 B) phosphoric chloride E) trichlorophosphide
C) phosphorus trichlorate

11. What is the molecular mass of ammonium sulfate?

- A) 63.07 amu D) 128.11 amu
B) 114.10 amu E) 132.13 amu
C) 118.13 amu

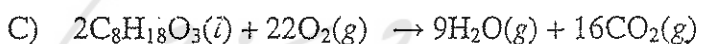
12. Calculate the number of moles in 17.8 g of the anti-acid magnesium hydroxide, $Mg(OH)_2$.

- A) 3.28 mol B) 2.32 mol C) 0.205 mol D) 0.431 mol E) 0.200 mol

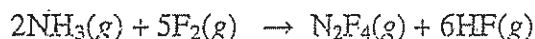
13. Calculate the mass of lead in 139 g of lead (II) nitrate, $Pb(NO_3)_2$.

- A) 107 g B) 90.8 g C) 87.0 g D) 83.4 g E) 62.6 g

14. Balance the following equation:



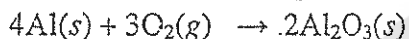
15. Ammonia will react with fluorine to produce dinitrogen tetrafluoride and hydrogen fluoride



How many moles of NH_3 are needed to react completely with 13.6 mol of F_2 ?

- A) 34.0 mol B) 27.2 mol C) 6.80 mol D) 5.44 mol E) 2.27 mol

16. Aluminum reacts with oxygen to produce aluminum oxide :



A mixture of 82.49 g of aluminum ($M = 26.98$ g/mol) and 117.65 g of oxygen ($M = 32.00$ g/mol) is allowed to react. Identify the limiting reactant and determine the mass of the excess reactant present in the vessel when the reaction is complete.

A) Oxygen is the limiting reactant; 19.81 g of aluminum remain.

B) Oxygen is the limiting reactant; 35.16 g of aluminum remain.

C) Aluminum is the limiting reactant; 16.70 g of oxygen remain.

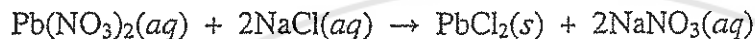
D) Aluminum is the limiting reactant; 35.16 g of oxygen remain.

E) Aluminum is the limiting reactant; 44.24 g of oxygen remain.

17. When 2.61 g of solid Na_2CO_3 is dissolved in sufficient water to make 250 mL of solution, the concentration of Na_2CO_3 is:

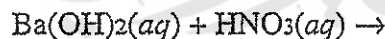
- A) 0.0985 M B) 10.4 M C) 0.205 M D) 0.0246 M E) 0.141 M

18. In the following reaction, what ions, if any, are spectator ions?



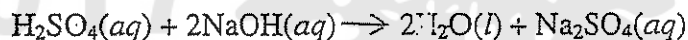
- A) $\text{Pb}^{2+}(\text{aq})$, $\text{Cl}^-(\text{aq})$ D) $\text{Na}^+(\text{aq})$, $\text{Cl}^-(\text{aq})$
 B) $\text{Na}^+(\text{aq})$, $\text{NO}_3^-(\text{aq})$ E) There are no spectator ions.
C) $\text{Pb}^{2+}(\text{aq})$, $\text{NO}_3^-(\text{aq})$

19. Select the correct set of products for the following reaction.



- A) $\text{BaN}_2(\text{s}) + \text{H}_2\text{O}(\text{l})$ D) $\text{Ba}_2\text{O}(\text{s}) + \text{NO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$
B) $\text{Ba}(\text{s}) + \text{H}_2(\text{g}) + \text{NO}_2(\text{g})$ E) No reaction occurs.
 C) $\text{Ba}(\text{NO}_3)_2(\text{aq}) + \text{H}_2\text{O}(\text{l})$

20. Automobile batteries use 3.0 M H_2SO_4 as an acid electrolyte. How much 1.20 M NaOH will be needed to neutralize 225 mL of the battery acid, H_2SO_4 ?



- A) 1.1 L B) 0.28 L C) 0.56 L D) 0.90 L E) 0.045 L

21. Select the precipitate that forms when aqueous lead(II) nitrate reacts with aqueous sodium sulfate.

- A) NaNO_3 B) Na_2NO_3 C) Pb_2SO_4 D) PbSO_4 E) PbS

GOOD LUCK

First



21
21
V. Ezzamel

Birzeit University
Chemistry Department
Chemistry 141

First Hour Exam

1st Sem. 2012-2013

Time: 70 min.

● Student Name: Rahaf Rimawi

● Student No: 1120125

● Instructor Name: Dr. Hijazi Abu Ali

● Section No: -----

Important note: There are (21) equally graded questions, please answer all of them.

E	D	C	B	A	Q
			X		1
	X				2
		X			3
		X			4
			X		5
			X		6
	X				7
			X		8
			X	X	9
			X	X	10
				X	11
				X	12
	X				13
X					14
	X				15
		X			16
X					17
				X	18
X					19
		X			20
			X		21

GOOD LUCK

Please read each question carefully before you answer, and choose the best correct answer

1. Which one is a physical property of sodium?

- A) Its surface turns black when first exposed to air.
- B) It is a solid at 25 °C and changes to a liquid when heated to 98 °C.
- C) When placed in water it sizzles and a gas is formed.
- D) When placed in contact with chlorine it forms a compound that melts at 801 °C.
- E) Sodium is never found as the pure metal in nature.

2. During the swing of a frictionless pendulum, what energy form(s) remain constant?

- A) kinetic energy only
- B) potential energy only
- C) both kinetic energy and potential energy
- D) kinetic plus potential energy
- E) None of these forms remains constant.

3. Which of the following represents the largest volume?

- A) 10,000 μL 10^{-2} L
- B) 1000 pL 10^{-12} L
- C) 100 mL 10^{-1} L
- D) 10 nL 10^{-8} L
- E) 10 cm^3 10^{-2} L

4. Isopropyl alcohol boils at 180.7 °F. What is the boiling point in kelvins?

- A) 387.6 K
- B) 323.6 K
- C) 355.6 K
- D) 190.8 K
- E) -190.8 K

5. Express 96342 m using 2 significant figures.

- A) $9.60 \times 10^4 \text{ m}$
- B) $9.6 \times 10^4 \text{ m}$
- C) $9.60 \times 10^{-4} \text{ m}$
- D) $9.6 \times 10^{-4} \text{ m}$
- E) 96000. m

6. Choose the response that includes all the items listed below that are pure substances.

- i. orange juice
 - ii. steam
 - iii. ocean water
 - iv. oxygen
 - v. vegetable soup
- A) i, iii, v
 - B) ii, iv
 - C) i, iii, iv
 - D) iv only
 - E) all of them are pure

7. Which of the following ions occurs commonly?

- A) P^{3+}
- B) Br^{7+}
- C) O^{6+}
- D) Ca^{2+}
- E) K^-

8. The correct name of MnSO_4 is:

- A) manganese disulfate
- B) manganese(II) sulfate
- C) manganese(IV) sulfate
- D) manganese sulfate
- E) manganese(I) sulfate

9. What is the formula for lead(II) oxide?

- A) PbO
- B) PbO_2
- C) Pb_2O
- D) PbO_4
- E) Pb_2O_3

Student Name: Raha Rimawi Student No: 1120125

10. What is the name of the acid formed when HClO_4 liquid is dissolved in water?

- A) hydrochloric acid B) perchloric acid C) chloric acid
D) chlorous acid E) hydrochlorate acid

11. Determine the molecular mass of iron(III) bromide hexahydrate. $\text{FeBr}_3 \cdot 6\text{H}_2\text{O}$

- A) 403.65 g B) 355.54 g C) 317.61 g D) 313.57 g E) 295.56 g

12. Rutherford's experiment with alpha particle scattering by gold foil established that:

- A) protons are not evenly distributed throughout an atom.
B) electrons have a negative charge.
C) electrons have a positive charge.
D) atoms are made of protons, neutrons, and electrons.
E) protons are 1840 times heavier than electrons.

13. A phosphide ion has: P^{3-}

- A) 10 p and 13 e B) 12 p and 15 e C) 15 p and 15 e D) 15 p and 18 e
E) 18 p and 21 e

14. Calculate the number of moles in 38.7 g of phosphorus pentachloride. PCl_5

- A) 5.38 mol B) 3.55 mol C) 0.583 mol D) 0.282 mol E) 0.186 mol

15. Calculate the number of chromium atoms in 78.82 g of $\text{K}_2\text{Cr}_2\text{O}_7$. $2 \text{ a.u. } 2$

- A) 9.490×10^{25} Cr atoms B) 2.248×10^{24} Cr atoms
C) 1.124×10^{24} Cr atoms D) 3.227×10^{23} Cr atoms
E) 1.613×10^{23} Cr atoms

16. Calculate the mass in grams of 3.65×10^{20} molecules of SO_3 .

- A) 6.06×10^{-4} g B) 2.91×10^{-2} g C) 4.85×10^{-2} g D) 20.6 g E) 1650 g

17. When 0.6943 g of terephthalic acid was subjected to combustion analysis it produced 1.471 g CO_2 and 0.226 g H_2O . If its molar mass is between 158 and 167 g/mol, what is its molecular formula?

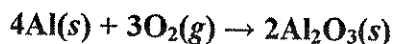
- A) $\text{C}_4\text{H}_6\text{O}_7$ B) $\text{C}_6\text{H}_8\text{O}_5$ C) $\text{C}_7\text{H}_{12}\text{O}_4$ D) $\text{C}_4\text{H}_3\text{O}_2$ E) $\text{C}_8\text{H}_6\text{O}_4$

18. Lead(II) sulfide reacts with hydrogen peroxide to form lead(II) sulfate and water. How many grams of hydrogen peroxide are needed to react completely with 265 g of lead(II) sulfide? H_2O_2 PbSO_4 H_2O

- A) 151 g B) 123 g C) 50.3 g D) 37.7 g E) 9.41 g

● Student Name: _____ ● Student No: _____

19. Aluminum reacts with oxygen to produce aluminum oxide.



A mixture of 82.49 g of aluminum ($M = 26.98 \text{ g/mol}$) and 117.65 g of oxygen ($M = 32.00 \text{ g/mol}$) is allowed to react. Identify the limiting reactant and determine the mass of the excess reactant present in the vessel when the reaction is complete.

- A) Oxygen is the limiting reactant; 19.81 g of aluminum remain.
- B) Oxygen is the limiting reactant; 35.16 g of aluminum remain.
- C) Aluminum is the limiting reactant; 16.70 g of oxygen remain.
- D) Aluminum is the limiting reactant; 35.16 g of oxygen remain.
- E) Aluminum is the limiting reactant; 44.24 g of oxygen remain.

20. What will be the final volume of a solution prepared by diluting 25 mL of 8.25 M sodium hydroxide to a concentration of 2.40 M?

- A) 330 mL B) 210 mL C) 86 mL D) 60 mL E) 7.3 mL

$$V_1 M_1 = V_2 M_2$$
$$25 \times 8.25 = V_2 \times 2.40$$

21. Which of the following is a true statement.

- A) A mole of one substance has the same number of atoms as a mole of any other substance.
- B) The experimental yield for a reaction is based on the results obtained in the laboratory.
- C) The concentration of a solution is an extensive property, but the amount of solute in a solution is an intensive property.
- D) To prepare 1.00 L of 3.00 M NaCl, weigh 175.5 g of NaCl and dissolve it in 1.00 L of distilled water.

Avogadro's number = 6.022×10^{23}

GOOD LUCK

17
20



BIRZEIT UNIVERSITY
Department of Chemistry
CHEM 141
First Hour Exam
First Semester 2009/2010

Name, ID #: Salam M. Qumsiyeh, 1090641 Discussion Section: 1

THE DURATION OF THE EXAM IS 75 MINUTES

Instructors: Dr. Talal Shahwan (Lecture 1, D5, D6)
Dr. Jack Mustaklem (Lecture 2, D2)
Dr. Zaki A. Hasan (D3, D4, D7)
Dr. Hani Awad (D1)

Q#	a	b	c	d	e	Q#	a	b	c	d	e
1		✓				12			✓		
2			✓			13	✓				
3				✓		14		✓	✍		
4		✓				15	✓	✍			
5		✓				16	✓			✍	
6		✍			✓	17	✓				
7				✓		18					✓
8		✓				19					✓
9			✓			20		✓			
10	✓					Bonus Q				✓	✍
11	✓										

22
25

BIRZEIT UNIVERSITY
CHEMISTRY DEPARTMENT
CHEM. 141 -1st HOUR EXAM

Spring 2011/2012

TIME: 70 Min

Student Name: ~~.....~~ Student No: ~~.....~~

INSTRUCTOR'S NAME:

Dr. Oraib Sayrafi

Dr. Talal Shahwan (6,7,8)

Discussion: Dr. Hani Awad (4)

Dr. Zaki Hasan (2,5)

Mr. Adi Qamhiyeh(1,3)

Question	a	b	c	d	e
1		X			
2					
3	X				X
4		X			
5					X
6	X		X		
7			X		
8	X		X		
9	X				
10			X		
11		X			
12		X			
13	X	X			
14	X				
15					
16	X			X	
17					
18				X	
19		X		X	
20	X				
21			X		
22		X	X		
23			X		
24		X			
25				X	

Avogadro's number = 6.022×10^{23} .

1. A broad generalization that summarizes and organizes data is called

- a. the scientific method
- b. a scientific law
- c. a scientific theory
- d. a hypothesis
- e. an empirical fact

2. Which one of the following is an extensive property of matter?

- a. density
- b. specific gravity
- c. electrical conductivity
- d. melting point
- e. mass

3. The two major types of pure substances are

- a. compounds and elements
- b. compounds and solutions
- c. elements and mixtures
- d. mixtures and solutions
- e. solutions and elements

4. An example of a chemical compound is

- a. orange juice
- b. brass
- c. bronze
- d. granite
- e. table salt

5. The relative number of atoms of each element in a particular compound

- a. is always 1:1
- b. is the same as the density ratio
- c. is the same as the weight ratio
- d. is definite and constant
- e. cannot be determined experimentally

6. The atomic weight of aluminum is 26.982 u. How many aluminum atoms are there in a 4.55 g sample of aluminum?

- $1 \text{ mole} \rightarrow 6.02 \times 10^{23}$
- $4.55 \text{ g} \rightarrow 0.169$
- 1.017×10^{23}
- a. 1.02×10^{23}
 - b. 1.32×10^{23}
 - c. 2.74×10^{24}
 - d. 3.57×10^{24}
 - e. 8.01×10^{23}

7. The kilo is
- unit of mass
 - a unit employed in medical terminology
 - a decimal multiplier in the metric system
 - a unit of speed
 - a volume unit employed by the DEA (drug enforcement agency)

8. Which one of the following compounds is correctly described as a hydrate?

- a. $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$ b. $\text{HC}_2\text{H}_3\text{O}_2$
 c. NaOH d. CaH_2 e. $\text{C}_6\text{H}_{12}\text{O}_6$

9. The melting point of antimony was listed in one handbook as 1167.3 °F. Expressed in kelvins this temperature would be

- $C = \frac{5}{9} (1167.3 - 32)$
 $360.7 = K + 273$
 $K = 360.7 - 273$
- a. 357.6 K b. 496.8 K c. 583.7 K
 d. 894.2 K e. 903.9 K

10. The SI prefixes mega and nano represent, respectively:

- a. 10^9 and 10^{-6}
 b. 10^{-6} and 10^9
 c. 10^6 and 10^{-9}
 d. 10^6 and 10^9
 e. 10^{-6} and 10^{-9}

11. When a student evaluates the expression,

$$\frac{0.04616 \times 0.082057 \times 293.30}{0.654}$$

the result should be expressed as

- a. 1.69 b. 1.70 c. 1.699
 d. 1.6987 e. 1.69870

12. The number, 0.0030600, is properly expressed in scientific notation

a. 3.0600×10^{-2}

b. 0.30600×10^{-2}

c. 0.306×10^{-2}

d. 3.06×10^{-3}

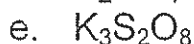
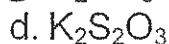
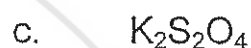
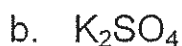
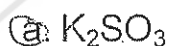
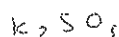
e. 3.0600×10^{-3}

13. A well-characterized compound contains potassium, sulfur, and oxygen.

The assay values are: potassium, 49.410%; sulfur, 20.261%.

Determine the empirical formula of this compound.

2 : 1 : 3



14. 4.626 gram sample of a hydrocarbon, upon combustion in a

$H \rightarrow 4.626$

combustion analysis apparatus, yielded 6.484 grams of carbon

dioxide. The percent, by weight, of carbon in the hydrocarbon is :

a. 38.25 %

b. 19.47 %

c. 71.35 %

d. 40.16 %

e. 42.16 %

15. In a quantitative analysis study, 2.644 grams of a hydrocarbon (which contains carbon and hydrogen only) sample yielded 8.008 g of CO_2 and 4.098 g of H_2O in a combustion analysis apparatus.

Determine the empirical formula of the hydrocarbon.

C : 2.18

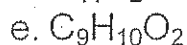
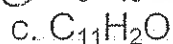
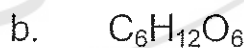
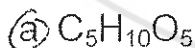
H : 0.182

1 : 2.5

1 : 5



16. A compound has an empirical formula CH_2O . An independent analysis gave a value of 150.13 for its molar mass. What is the correct molecular formula?



1 → 4
3218 → 2

17. Given a chemical reaction, $C_4H_8 + 6O_2 \rightarrow 4CO_2 + 4H_2O$.
If 0.3218 moles of C_4H_8 are allowed to react with 2.000 moles of O_2 , what would be the theoretical yield of water, in moles?

- a. 1.333 moles
b. 1.609 moles
c. 0.6436 moles
d. 1.287 moles
e. 2.574 moles
- $C_4H_8 \quad O$
1. 6
1. 6.2

18. Thermal decomposition of $KClO_3(s)$ yields $KCl(s)$ and $O_2(g)$. When 4.289 grams of $KClO_3$ (0.03500 moles) undergo this reaction, how many grams of oxygen are produced?

- a. 1.120 grams
b. 0.5601 grams
c. 2.240 grams
d. 1.680 grams
e. 4.288 grams
- $2 KClO_3 \rightarrow 2 KCl + 3 O_2$
2 → 3
0.03500 → ??

19. In a chemical reaction, $3C_2H_6O + PCl_3 \rightarrow 3C_2H_5Cl + H_3PO_3$, when the reaction was carried out, the actual yield of C_2H_5Cl was calculated 97.3 % of the theoretical value. If the theoretical yield should have been 2.04 moles, how many grams of C_2H_5Cl were actually obtained?

$0.973 \times 2.04 = 1.985$
1.985 x 62.5 = 124.0625

- a. 123 grams
b. 128 grams
c. 132 grams
d. 135 grams
e. 138 grams

20. 66.7 mL of 18.0 molar sulfuric acid solution was dissolved in enough water to make 500 mL of solution. The molarity of the diluted mixture is

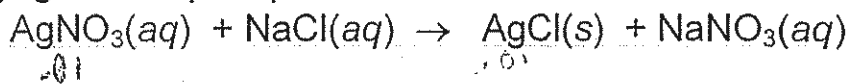
$0.667 \times 18 = 1.2$
 $1.2 \times 0.133 = 0.16$

- a. 2.40 molar
b. 0.135 molar
c. 36.0 molar
d. 9.00 molar
e. 0.00741 molar

21. When the expression, $412.272 + 0.00031 - 1.00797 + 0.000024 + 12.8$ is evaluated, the result should be expressed as

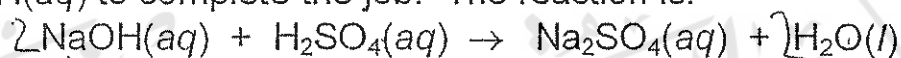
- a. 424
b. 424.0
c. 424.1
d. 424.06
e. 424.064364

22. A 50.0 mL sample of 0.200 molar $\text{AgNO}_3(\text{aq})$ was allowed to react with an excess of $\text{NaCl}(\text{aq})$. The AgCl precipitate which resulted from the reaction as shown below was carefully dried and weighed. How many grams of precipitate should be obtained?



- a. 1.08 g
 b. 1.43 g
 c. 1.70 g
 d. 3.13 g
 e. 62.6 g

23. When 25.0 mL of sulfuric acid solution was completely neutralized in a titration with 0.050 molar NaOH solution, it took 18.3 mL of the $\text{NaOH}(\text{aq})$ to complete the job. The reaction is:



What was the molarity of the sulfuric acid solution?

- a. 0.0100
 b. 0.0148
 c. 0.0183
 d. 0.0325
 e. 0.0366

24. A sample of $(\text{N}_2\text{H}_5)_2\text{C}_3\text{H}_4\text{O}_4$ contains 1.084×10^{24} carbon atoms. How many moles of hydrogen atoms are there in the same sample? Avogadro's number = 6.022×10^{23} .

- a. 4.200 moles
 b. 4.725 moles
 c. 7.000 moles
 d. 8.400 moles
 e. 2.400 moles

1 mole $\rightarrow 6.02 \times 10^{23}$ atoms
 ?? $\rightarrow 1.084 \times 10^{24}$
 3C \rightarrow 1.8 mole =
 14H \rightarrow 5.04 mole = 5.04 moles of C

25. An empty volumetric flask, weighing 60.42 grams, when filled with water it weighed 309.60 g. After emptying the water and drying the flask, it was filled with ethylene glycol. It now weighed 338.72 grams. What is the specific gravity of the ethylene glycol?

- a. 0.8048
 b. 0.9140
 c. 1.094
 d. 1.1169
 e. 1.2424

mass 249.18
 u
 $1 = \frac{249.18}{u}$
 ethylene glycol mass 278.3
 u
 $= \frac{278.3}{249.18} = 1.117$

PERIODIC TABLE OF THE ELEMENTS^a

1 H 1.00794	2 He 4.00260	Noble gases																																																																																																						
3 Li 6.941	4 Be 9.01218	5 B 10.811	6 C 12.011	7 N 14.00674	8 O 15.9994	9 F 18.998410	10 Ne 20.1797	11 Na 22.98977	12 Mg 24.3050	13 Al 26.98154	14 Si 28.0855	15 P 30.97376	16 S 32.066	17 Cl 35.4527	18 Ar 39.948	19 K 39.0983	20 Ca 40.078	21 Sc 44.95591	22 Ti 47.88	23 V 50.9415	24 Cr 51.9961	25 Mn 54.9380	26 Fe 55.847	27 Co 58.93320	28 Ni 58.69	29 Cu 63.546	30 Zn 65.39	31 Ga 69.723	32 Ge 72.61	33 As 74.92159	34 Se 78.96	35 Br 79.904	36 Kr 83.80	37 Rb 85.4678	38 Sr 87.62	39 Y 88.90585	40 Zr 91.224	41 Nb 92.90638	42 Mo 95.94	43 Tc 98.9072	44 Ru 101.07	45 Rh 102.90550	46 Pd 106.42	47 Ag 107.8682	48 Cd 112.411	49 In 114.82	50 Sn 118.710	51 Sb 121.75	52 Te 127.60	53 I 126.90447	54 Xe 131.29	55 Cs 132.90543	56 Ba 137.327	57 La 138.9055	58 Ce 140.12	59 Pr 140.90765	60 Nd 144.24	61 Pm 144.9127	62 Sm 150.36	63 Eu 151.964	64 Gd 157.25	65 Tb 158.92534	66 Dy 162.50	67 Ho 164.93032	68 Er 167.259	69 Tm 168.93421	70 Yb 173.054	71 Lu 174.967	72 Hf 178.49	73 Ta 180.9479	74 W 183.85	75 Re 186.207	76 Os 190.2	77 Ir 192.22	78 Pt 195.08	79 Au 196.96654	80 Hg 200.59	81 Tl 204.3833	82 Pb 207.2	83 Bi 208.98037	84 Po 208.9824	85 At 209.9871	86 Rn 222.0176	87 Fr 223.0197	88 Ra 226.0254	89 Ac 227.0371	90 Th 232.0377	91 Pa 231.036	92 U 238.02891	93 Np 237.04817	94 Pu 244.06422	95 Am 243.06138	96 Cm 247.07035	97 Bk 247.07035	98 Cf 251.0825	99 Es 252.083	100 Fm 257.1037	101 Md 258.1037	102 No 259.1037	103 Lr 260.1037	104 Unq 261.11	105 Unp 262.114	106 Uhh 263.118	107 Uns 262.12

^a Atomic masses are the 1985 values given in the Table of Atomic Masses and Atomic Numbers (opposite) but rounded, where appropriate to the fifth decimal place.

Avogadro number = 6.02×10^{23}

Periodic Table of the Elements

1A (1)	2A (2)	3B (3)	4B (4)	5B (5)	6B (6)	7B (7)	8B (8)	9B (9)	10B (10)	11B (11)	12B (12)	3A (13)	4A (14)	5A (15)	6A (16)	7A (17)	8A (18)														
1 H 1.008	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	13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.07	17 Cl 35.46	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 65.41	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 131.9														
55 Cs 132.9	56 Ba 137.3	57 La 138.9	58 Pr 140.9	59 Nd 144.2	60 Pm (145)	61 Sm 150.4	62 Eu 152.0	63 Gd 157.3	64 Tb 158.9	65 Dy 162.5	66 Ho 164.9	67 Er 167.3	68 Tm 168.9	69 Yb 173.0	70 Lu 175.0	71 Hf 178.5	72 Ta 180.9	73 W 183.8	74 Re 186.2	75 Os 190.2	76 Ir 192.2	77 Pt 195.1	78 Au 197.0	79 Hg 200.6	80 Tl 204.4	81 Pb 207.2	82 Bi 209.0	83 Po (209)	84 At (210)	85 Rn (222)	
87 Fr (223)	88 Ra (226)	89 Ac (227)	90 Th 232.0	91 Pa 231.0	92 U 238.0	93 Np (237)	94 Pu 242.0	95 Am 243.0	96 Cm 247.0	97 Bk 247.0	98 Cf 251.0	99 Es 252.0	100 Fm 257.0	101 Md 259.0	102 No 259.0	103 Lr 260.0	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (267)	108 Hs (277)	109 Mt (268)	110 Ds (271)	111 Rg (272)	112 Cn (285)	113 Nh (284)	114 Fl (289)	115 Mc (288)	116 Lv (293)	117 Ts (294)	118 Og (294)

As of late 2007, elements 112 through 118 have not been named.

6	Lanthanides	58	Ce	59	Pr	60	Nd	61	Pm	62	Sm	63	Eu	64	Gd	65	Tb	66	Dy	67	Ho	68	Er	69	Tm	70	Yb	71	Lu
7	Actinides	90	Th	91	Pa	92	U	93	Np	94	Pu	95	Am	96	Cm	97	Bk	98	Cf	99	Es	100	Fm	101	Md	102	No	103	Lr



19

BirZeit University
Chemistry Department
Chemistry 143

First Hour Exam

2nd Sem. 2014/2015

Instructors:

Dr. Hani Awad	(D4)
Dr. Adel Hidmi	(D7)
Dr. Amjad Altaweel	(D1+D10)
Dr. Mohammad Qneibi	(D8)
Dr. Ismael Bedran	(D3)
Mr. Adi Qamhieh	(D2, D9, D5)
Ms. Salam Maloul	(D6)

- Student Name: د. سلام مالح
- Student No: 1142724.
- Section No: الخميس

GOOD LUCK

Student Name محمد عبد

Student number 1142724

1	A	<u>B</u>	C	D	E
2	A	B	C	<u>D</u>	E
3	A	B	C	<u>D</u>	E
4	A	B	<u>C</u>	D	E
5	A	B	C	<u>D</u>	E
6	A	B	C	<u>D</u>	E
7	A	B	C	<u>D</u>	E
8	A	<u>B</u>	C	D	E
9	A	B	C	<u>D</u>	E
10	A	B	<u>C</u>	D	E
11	A	<u>B</u>	C	D	E
12	<u>A</u>	B	C	D	E
13	A	<u>B</u>	C	D	E
14	A	B	C	<u>D</u>	E
15	A	<u>B</u>	C	D	E
16	<u>A</u>	B	C	D	E
17	<u>A</u>	B	C	D	E
18	A	B	C	D	<u>E</u>
19	A	B	<u>C</u>	D	E
20	A	B	<u>C</u>	D	E
21	A	B	<u>C</u>	D	E
22	<u>A</u>	B	C	D	E

1. Which one of the following represents a chemical change?

A) boiling water to form steam

B) turning hair yellow with bleach

C. melting butter

D. mixing powdered charcoal and oxygen at room temperature

E. cutting a bar of sodium metal into pieces with a knife

2. How many significant figures does the result of the following sum contain? $8.5201 + 1.93$

A) 1

B) 2

C) 3

D) 4

E) 5

3. Rutherford's experiment with alpha particle scattering by gold foil established that

A) protons are not evenly distributed throughout an atom.

B) electrons have a negative charge.

C) electrons have a positive charge.

D) atoms are made of protons, neutrons, and electrons.

E) protons are 1840 times heavier than electrons.

4. Give the number of protons (p), electrons (e), and neutrons (n) in one atom of chlorine-37.

A) 37 p, 37 e, 17 n

B) 17 p, 17 e, 37 n

C) 17 p, 17 e, 20 n

D) 37 p, 17 e, 20 n

E) 17 p, 37 e, 17 n

5. How many silicon atoms are there in 1.00 g of silicon?

A) 1 atom

B) 0.0356 atoms

C) 2.57×10^{23} atoms

D) 2.14×10^{22} atoms

E) 1.75×10^{25} atoms

6. What is the percent CsCl by mass in a 0.711 M (mole/L) CsCl solution that has a density of 1.091 g/mL?

A) 3.87×10^{-4} %

B) 3.87×10^{-1} %

C) 11.0 %

D) 1.1 %

E) 6.5×10^{-2} %

7. The name of HClO_2 is

A) hydrochloric acid

B) chloroform

C) hydrogen dioxchloride

D) chlorous acid

E) chloric acid

8. The stock system name for CrSO_3 is:

A) chromium sulfide

B) chromium(II) sulfite

C) chromium(II) sulfate

D) chromium(III) sulfite

E) chromium sulfur oxide

9. Write and balance the equation for the combustion of ferrocene, $\text{C}_{10}\text{H}_{10}\text{Fe}$, in oxygen to give iron(III) oxide, carbon dioxide, and water.

A) $\text{C}_{10}\text{H}_{10}\text{Fe}(s) + \text{O}_2(g) \rightarrow 2 \text{Fe}_2\text{O}_3(s) + 10 \text{CO}_2(g) + 5 \text{H}_2\text{O}(g)$

B) $\text{C}_{10}\text{H}_{10}\text{Fe}(s) + 13 \text{O}_2(g) \rightarrow \text{FeO}(s) + 10 \text{CO}_2(g) + 5 \text{H}_2\text{O}(g)$

C) $2 \text{C}_{10}\text{H}_{10}\text{Fe}(s) + 26 \text{O}_2(g) \rightarrow \text{Fe}_2\text{O}_3(s) + 20 \text{CO}_2(g) + 10 \text{H}_2\text{O}(g)$

D) $4 \text{C}_{10}\text{H}_{10}\text{Fe}(s) + 53 \text{O}_2(g) \rightarrow 2 \text{Fe}_2\text{O}_3(s) + 40 \text{CO}_2(g) + 20 \text{H}_2\text{O}(g)$

10. Hydrazine, N_2H_4 , is an important industrial reagent. It is synthesized by the Raschig process. $2 NaOH + Cl_2 + 2 NH_3 \rightarrow N_2H_4 + 2 NaCl + 2 H_2O$

If you combine 100. g each of NaOH, Cl_2 , and NH_3 , some amount of two of the three reactants will be left when the reaction is complete. The two reactants that are left over are

- A) NaOH and Cl_2 B) NaOH and NH_3 C) Cl_2 and NH_3
D) all of the reactant will be consumed in the reaction.

11. The formula of caffeine is $C_8H_{10}N_4O_2$. Calculate the mass of 1.15×10^{-3} moles of caffeine.

- A) 0.106 g B) 0.223 g C) 1.96×10^{-3} g D) 2.71 g

12. Citric acid, $C_6H_8O_7$, is found in many fruits. What is the weight percent of carbon in the compound?

- A) 37.5% B) 4.2% C) 58.3% D) 18.8%

13. What volume is occupied by 4.00 grams of carbon dioxide gas at a pressure of 0.976 atm and a temperature of $25.0^\circ C$?

- A) 0.191 L B) 2.28 L C) 19.1 L D) 22.8 L

14. What is the molar mass of an unknown gas if the density of that gas is 0.726 grams/liter at a pressure of 71 mm Hg and a temperature of $25^\circ C$?

- A) 5.71 g/mole B) 15.9 g/mole C) 44.0 g/mole D) 190 g/mole

15. 1.000 atm of oxygen gas, placed in a container having a pinhole opening in its side, leaks from the container 2.14 times faster than does 1.000 atm of an unknown gas placed in this same apparatus. Which of these species could be the unknown gas?

- A) Cl_2 B) SF_6 C) Kr D) UF_6 E) Xe

16. A sample of N_2 is contained in a 255 mL flask at $24^\circ C$; its pressure is 45.6 mm Hg. If the gas is transferred to a 750. mL flask, and the temperature is now $35^\circ C$, what is the pressure of the gas?

- A) 16.1 mm Hg B) 139 mm Hg C) 15.0 mm Hg D) 22.6 mm Hg

17. If equal masses of $O_2(g)$ and $HBr(g)$ are in separate containers of equal volume and temperature, which one of these statements is true?

- A) The pressure in the O_2 container is greater than that in the HBr container.
B) There are more HBr molecules than O_2 molecules.
C) The average velocity of the O_2 molecules is less than that of the HBr molecules.
D) The average kinetic energy of HBr molecules is greater than that of O_2 molecules.
E) The pressures of both gases are the same.

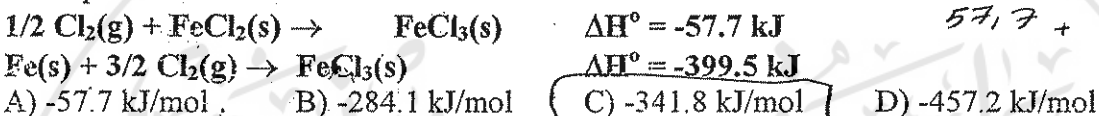
18. A compound contains only calcium and fluorine. A sample of the compound is determined to contain 2.00 g of calcium and 1.90 g of fluorine. According to the Law of Definite Proportions, how much calcium should another sample of this compound contain if it contains 2.85 g of fluorine?

- A) 2.71 g B) 4.50 g C) 4.00 g D) 6.00 g E) 3.00 g

19. When 221 grams of water at a temperature of 25.0 °C is mixed with an unknown mass of water at a temperature of 57.0 °C the final temperature of the resulting mixture is 33.1 °C. What was the mass of the second sample of water?

- A) 29.5 g B) 67.0 g C) 74.9 g D) 131 g

20. Calculate the standard molar enthalpy of formation of FeCl₂(s) using the following standard enthalpies of reaction:



21. When 0.560 g of Na(s) reacts with excess F₂(g) to form NaF(s), 13.8 kJ of heat is evolved at standard-state conditions. What is the standard enthalpy of formation (ΔH°_f) of NaF(s)?

- A) 24.8 kJ/mol D) -7.8 kJ/mol
B) 570 kJ/mol E) -570 kJ/mol
C) -24.8 kJ/mol

22. An exothermic reaction causes the surroundings to

- A) warm up D) decrease its temperature.
B) become acidic. E) release CO₂.
C) expand.

Excellent
104
100

Birzeit University---Chemistry Department

1st Hr. Exam

Chem. 141

1st. Sem.2013/2014

Time: 80 Minutes

Instructors: Dr. Zaki Hassan (Sections 1 and 2)

Dr. Abdullatif Abuhijleh (Sections 3 and 4)

Dr. Mazen Hamed (Sections 5 and 6)

Student name

Student No.

Student Section

3

Circle the correct answer

1. What is the formula for lithium nitrite?

LiNO₂

A) LiNO₃

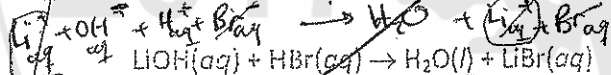
B) Li₂NO₃

C) LiNO₂

D) Li₂NO₂

E) LiNO₂

2. Select the net ionic equation for the reaction between lithium hydroxide and hydrobromic acid.



A) $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l})$

B) $\text{Li}^+(\text{aq}) + \text{OH}^-(\text{aq}) + \text{H}^+(\text{aq}) + \text{Br}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{LiBr}(\text{aq})$

C) $\text{Li}^+(\text{aq}) + \text{Br}^-(\text{aq}) \rightarrow \text{LiBr}(\text{aq})$

D) $\text{HBr}(\text{aq}) \rightarrow \text{H}^+(\text{aq}) + \text{Br}^-(\text{aq})$

E) $\text{LiOH}(\text{aq}) \rightarrow \text{Li}^+(\text{aq}) + \text{OH}^-(\text{aq})$

3. Which of the following is the empirical formula for hexane, C₆H₁₄?

A) CH_{2.3}

B) C₁₂H₂₈

C) C_{0.43}H

D) C₃H₇

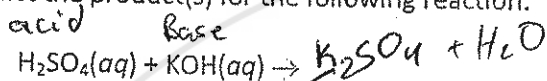
E) C₆H₁₄

LiOH

4. Lithium hydroxide is used in alkaline batteries. Calculate the molarity of a solution prepared by dissolving 1.495 moles of LiOH in enough water to give a final volume of 750. mL.

- A) 1.99 M B) 1.12 M C) 0.00199 M D) 1.50 M E) 0.502 M

5. Predict the product(s) for the following reaction.



- A) $\text{K}(\text{s}) + \text{H}_2(\text{g}) + \text{SO}_3(\text{g})$ D) $\text{K}_2\text{S}(\text{aq}) + \text{H}_2\text{O}(\text{l})$
B) $\text{K}_2\text{SO}_4(\text{aq}) + \text{H}_2\text{O}(\text{l})$ E) No reaction occurs.
C) $\text{KSO}_4(\text{aq}) + \text{H}_2\text{O}(\text{l})$

6. Given that 1 inch = 2.54 cm, 1 cm³ is equal to

- A) 0.155 in³ B) 6.45 in³ C) 0.394 in³ D) 0.0610 in³ E) 16.4 in³

~~1 in~~
 $(1 \text{ in})^3 = (2.54 \text{ cm})^3$

7. Silicon has three naturally occurring isotopes, ²⁸Si, ²⁹Si, and ³⁰Si. Use the following data to calculate the atomic mass of silicon.

Isotope	Isotopic Mass (amu)	Abundance %
²⁸ Si	27.976927	92.23
²⁹ Si	28.976495	4.67
³⁰ Si	29.973770	3.10

- A) 28.7260 amu D) 28.9757 amu
B) 27.9801 amu E) 29.2252 amu

C) 28.0855 amu

$$\frac{(244.2 - 32) \times 5}{9}$$

8. Acetic acid boils at 244.2°F. What is its boiling point in degrees Celsius?

- A) 153.4°C B) 382.0°C C) 117.9°C D) 103.7°C E) 167.7°C

9. What is the correct name for MgF₂?

- A) monomagnesium difluoride
B) magnesium(III) fluoride
C) magnesium difluoride
D) magnesium fluoride
E) none of these choices is correct.

10. The sugar, sucrose, has the molecular formula C₁₂H₂₂O₁₁. What is the % of carbon in sucrose, by mass?

- (12)(12) + 22(1) + 11(16)
A) 42.1% B) 52.8% C) 41.4% D) 33.3% E) 26.7%

11. The appropriate number of significant figures in the result of 15.234 - 15.208 is:

- 0.026
A) 1 B) 2 C) 3 D) 4 E) 5

12. Which one of the following combinations of names and formulas is incorrect?

- A) NaHCO₃ sodium carbonate D) H₃PO₄ phosphoric acid
B) HCl hydrochloric acid E) HNO₃ nitric acid
C) KOH potassium hydroxide

17. Which of the following correctly expresses 0.000007913 g in scientific notation?

- A) 7.913×10^{-5} g
 B) 7.913×10^{-9} g
 C) 7.913×10^5 g
 D) 7.913×10^6 g
 E) 7.913×10^{-6} g

18. Which of the following is a non-metal?

- A) calcium, Ca, Z = 20
 B) sodium, Na, Z = 11
 C) bromine, Br, Z = 35
 D) lithium, Li, Z = 3
 E) lead, Pb, Z = 82

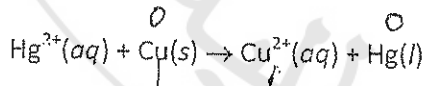
19. Determine the molecular mass of iron (III) bromide hexahydrate.

- A) 317.61 amu
 B) 295.56 amu
 C) 355.54 amu
 D) 403.65 amu
 E) 313.57 amu

20. Calculate the oxidation number of the chlorine in perchloric acid, HClO_4 , a strong oxidizing agent.

- A) -1
 B) +7
 C) +5
 D) +4
 E) None of these is the correct oxidation number.

21. Identify the reducing agent in the following redox reaction.

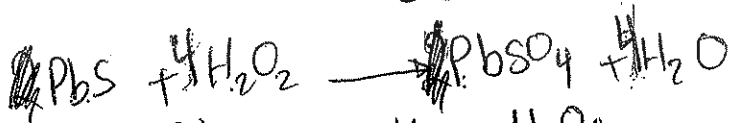


- A) $\text{Hg}^{2+}(\text{aq})$ and $\text{Cu}^{2+}(\text{aq})$
 B) $\text{Cu}^{2+}(\text{aq})$
 C) $\text{Hg}(\text{l})$
 D) $\text{Hg}^{2+}(\text{aq})$
 E) $\text{Cu}(\text{s})$

22. Lead(II) sulfide (PbS) reacts with hydrogen peroxide to form lead(II) sulfate and water. How

many grams of hydrogen peroxide are needed to react completely with 265 g of lead(II) sulfide?

- A) 37.7 g
 B) 9.41 g
 C) 151 g
 D) 123 g
 E) 50.3 g

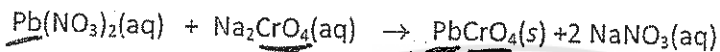


1 mol PbS
 1.1088

→ 4 mol H₂O₂
 " "
 = 4.4352 mol H₂O₂
 34
 = 150.8

PbS
 207 + 32
 = 239
 = 1.1088 mol

23. The spectator ions for the reaction of an aqueous solutions of lead nitrate, $\text{Pb}(\text{NO}_3)_2$, with sodium chromate, Na_2CrO_4 , to form a precipitate of lead chromate are :



- A) $\text{CrO}_4^{2-}(\text{aq})$ and $\text{Na}^+(\text{aq})$ D) $\text{Pb}^{2+}(\text{aq})$ and $\text{CrO}_4^{2-}(\text{aq})$
 B) $\text{Na}^+(\text{aq})$ and $\text{Pb}^{2+}(\text{aq})$ E) $\text{Na}^+(\text{aq})$ and $\text{NO}_3^-(\text{aq})$
 C) $\text{Pb}^{2+}(\text{aq})$ and $\text{NO}_3^-(\text{aq})$

24. Calculate the number of oxygen atoms in 29.34 g of sodium sulfate, Na_2SO_4 . = 142 g/mol

- A) 2.409×10^{24} O atoms
 B) 1.166×10^{25} O atoms
 C) 4.976×10^{23} O atoms

~~D) 1.244×10^{23} O atoms~~ E) 2.015×10^{24} O atoms

Handwritten calculations:
 $29.34 \text{ g} \div 142 \text{ g/mol} = 0.206 \text{ mol}$
 $0.206 \text{ mol} \times 4 \text{ O atoms/mol} = 0.826 \text{ mol O}$
 $0.826 \text{ mol O} \times 6.022 \times 10^{23} \text{ atoms/mol} = 4.976 \times 10^{23} \text{ atoms}$

25. Balance the following equation for the combustion of benzene:



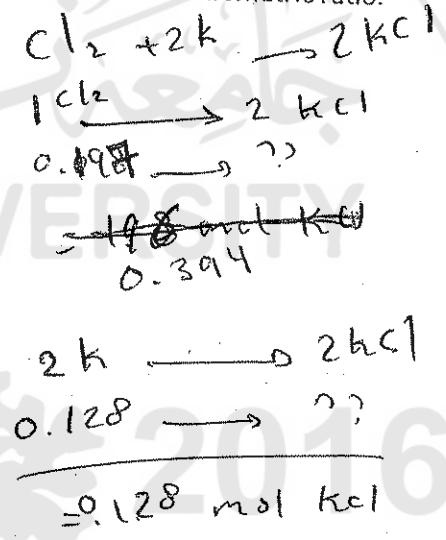
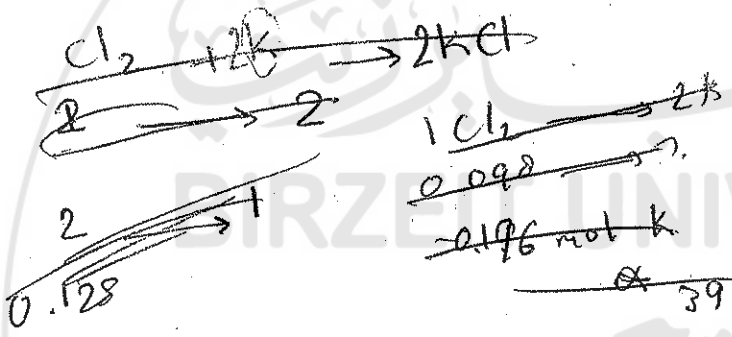
- A) $2\text{C}_6\text{H}_6(\text{l}) + 15\text{O}_2(\text{g}) \rightarrow 6\text{H}_2\text{O}(\text{g}) + 12\text{CO}_2(\text{g})$
 B) $2\text{C}_6\text{H}_6(\text{l}) + 9\text{O}_2(\text{g}) \rightarrow 6\text{H}_2\text{O}(\text{g}) + 12\text{CO}_2(\text{g})$
 C) $\text{C}_6\text{H}_6(\text{l}) + 9\text{O}_2(\text{g}) \rightarrow 6\text{H}_2\text{O}(\text{g}) + 6\text{CO}_2(\text{g})$
 D) $\text{C}_6\text{H}_6(\text{l}) + 9\text{O}_2(\text{g}) \rightarrow 3\text{H}_2\text{O}(\text{g}) + 6\text{CO}_2(\text{g})$
 E) $\text{C}_6\text{H}_6(\text{l}) + 15\text{O}_2(\text{g}) \rightarrow 3\text{H}_2\text{O}(\text{g}) + 6\text{CO}_2(\text{g})$

Handwritten balancing attempt:
 $2\text{C}_6\text{H}_6 + 15\text{O}_2 \rightarrow 6\text{H}_2\text{O} + 12\text{CO}_2$
 ~~$2\text{C}_6\text{H}_6 + 15\text{O}_2 \rightarrow 3\text{H}_2\text{O} + 6\text{CO}_2$~~

26. Identify the limiting reactant and determine the mass of the excess reactant remaining when 7.00 g of chlorine gas reacts with 5.00 g of potassium to form potassium chloride.

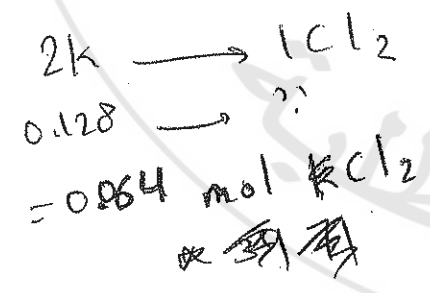
- A) Chlorine is the limiting reactant; 2.70 g of potassium remain.
 B) Chlorine is the limiting reactant; 4.64 g of potassium remain.
 C) Potassium is the limiting reactant; 2.47 g of chlorine remain.
 D) Potassium is the limiting reactant; 7.23 g of chlorine remain.
 E) No limiting reagent: the reactants are present in the correct stoichiometric ratio.

$\frac{7}{35.5}$
 $\frac{5}{39}$
 $\frac{0.197}{0.128}$



GOOD LUCK

K is the limiting





Birzeit University
Chemistry Department
Chemistry 141

First Exam

1st Sem. 2012-2013

Student Name: _____

Student No.: _____

Section No.: _____

E	D	C	B	A	
					21
					22
					23
					24
					25
					26

E	D	C	B	A	
					1
					2
					3
					4
					5
					6
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					10
					11
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					19
					20

PERIODIC TABLE OF THE ELEMENTS

<http://www.periodni.com>

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1 1 H 1.0079 HYDROGEN	2 4 Li 6.941 LITHIUM	3 9 Be 9.0122 BERYLLIUM	4 12 Na 22.990 SODIUM	5 20 Mg 24.305 MAGNESIUM	6 24 Al 26.981 ALUMINUM	7 25 Si 28.086 SILICON	8 26 P 30.974 PHOSPHORUS	9 32 S 32.065 SULFUR	10 39 K 39.098 POTASSIUM	11 40 Ca 40.078 CALCIUM	12 44 Zn 65.38 ZINC	13 51 Ga 69.723 GALLIUM	14 52 Ge 72.64 GERMANIUM	15 59 Br 79.904 BROMINE	16 79 Au 196.967 GOLD	17 80 Hg 200.59 MERCURY	18 86 Rn 222 RADON	
2 3 Li 6.941 LITHIUM	4 9 Be 9.0122 BERYLLIUM	5 12 Mg 24.305 MAGNESIUM	6 13 Al 26.981 ALUMINUM	7 14 Si 28.086 SILICON	8 15 P 30.974 PHOSPHORUS	9 16 S 32.065 SULFUR	10 17 Cl 35.453 CHLORINE	11 18 Ar 39.948 ARGON	12 19 K 39.098 POTASSIUM	13 20 Ca 40.078 CALCIUM	14 29 Cu 63.546 COPPER	15 30 Zn 65.38 ZINC	16 31 Ga 69.723 GALLIUM	17 32 Ge 72.64 GERMANIUM	18 33 As 74.922 ARSENIC	19 34 Se 78.96 SELENIUM	20 35 Br 79.904 BROMINE	21 36 Kr 83.80 KRYPTON
3 11 Na 22.990 SODIUM	12 19 Mg 24.305 MAGNESIUM	13 20 Ca 40.078 CALCIUM	14 21 Sc 44.956 SCANDIUM	15 22 Ti 47.867 TITANIUM	16 23 V 50.942 VANADIUM	17 24 Cr 51.996 CHROMIUM	18 25 Mn 54.938 MANGANESE	19 26 Fe 55.845 IRON	20 27 Co 58.933 COBALT	21 28 Ni 58.693 NICKEL	22 29 Cu 63.546 COPPER	23 30 Zn 65.38 ZINC	24 31 Ga 69.723 GALLIUM	25 32 Ge 72.64 GERMANIUM	26 33 As 74.922 ARSENIC	27 34 Se 78.96 SELENIUM	28 35 Br 79.904 BROMINE	29 36 Kr 83.80 KRYPTON
4 19 K 39.098 POTASSIUM	20 38 Sr 87.62 STRONTIUM	21 39 Y 88.906 YTIORIUM	22 40 Zr 91.224 ZIRCONIUM	23 41 Nb 92.906 NIOBIUM	24 42 Mo 95.94 MOLYBDENUM	25 43 Tc 98 TECHNETIUM	26 44 Ru 101.07 RHODIUM	27 45 Rh 102.91 RHENIUM	28 46 Pd 106.42 PALLADIUM	29 47 Ag 107.87 SILVER	30 48 Cd 112.41 CADMIUM	31 49 In 114.82 INDIUM	32 50 Sn 118.71 TIN	33 51 Sb 121.76 ANTIMONY	34 52 Te 127.60 TELLURUM	35 53 I 126.90 IODINE	36 54 Xe 131.29 XENON	
5 37 Rb 85.468 RUBIDIUM	38 56 Ba 137.33 BARIUM	39 57 La-Lu 138.905 LANTHANIDE	40 72 Hf 178.49 HAFNIUM	41 73 Ta 180.95 TANTALUM	42 74 W 183.84 WOLFRAM	43 75 Re 186.21 RHENIUM	44 76 Os 190.23 OSMIUM	45 77 Ir 192.22 IRIDIUM	46 78 Pt 195.08 PLATINUM	47 79 Au 196.967 GOLD	48 80 Hg 200.59 MERCURY	49 81 Tl 204.38 THALLIUM	50 82 Pb 207.2 LEAD	51 83 Bi 208.98 BISMUTH	52 84 Po 209 POLONIUM	53 85 At 210 ASTATINE	54 86 Rn 222 RADON	
6 55 Cs 132.91 CAESIUM	56 88 Ra 226 RADIUM	57 89 La-Lu 138.905 LANTHANIDE	58 104 Rf 261 RUFORDIUM	59 105 Db 262 DUBNIUM	60 106 Sg 263 SEABORGIUM	61 107 Bh 264 BOHRIUM	62 108 Hs 265 HASSIUM	63 109 Mt 266 MEITNERIUM	64 110 Ds 267 DARMSTADTIUM	65 111 Rg 268 ROSGOLDIUM	66 112 Cn 269 COOKIUM	67 113 Nh 270 NIHONIUM	68 114 Fl 271 FLEROVIUM	69 115 Uup 272 UNUNPENTIUM	70 116 Lv 273 LIVERMORIUM	71 117 Uts 274 UNUNSEPTIUM	72 118 Og 276 OGANESSIUM	
7 87 Fr 223 FRANCIUM	88 89 Ra 226 RADIUM	89 90 Ac-Lu 138.905 ACTINIDE	91 103 Nh 284 NIHONIUM	92 104 Fl 285 FLEROVIUM	93 105 Lv 286 LIVERMORIUM	94 106 Ts 287 TENNESSIUM	95 107 Og 288 OGANESSIUM	96 108 Uue 289 UNUNOCTIUM	97 109 Uuh 290 UNUNNONIUM	98 110 Uuq 291 UNQUINQUENTIUM	99 111 Uub 292 UNBIVENTIUM	100 112 Uuo 293 UNUNOVIUM	101 113 Uuq 294 UNQUINQUENTIUM	102 114 Uub 295 UNBIVENTIUM	103 115 Uut 296 UNTRIVENTIUM	104 116 Uuq 297 UNQUINQUENTIUM	105 117 Uub 298 UNBIVENTIUM	106 118 Uuo 299 UNUNOVIUM

RELATIVE ATOMIC MASS (A)

GROUP IUPAC

GROUP GAS

ATOMIC NUMBER (Z)

SYMBOL

ELEMENT NAME

STANDARD STATE (25 °C; 101 kPa)

Ms - gas
Mq - liquid
Me - solid
Ts - synthetic

Legend:

- Metal
- Semimetal
- Nonmetal
- Alkali metal
- Alkaline earth metal
- Transition metals
- Lanthanide
- Actinide
- Chalcogens element
- Halogens element
- Noble gas

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LANTHANIDE

(1) Pure Appl. Chem. 81, No. 11, 2131-2156 (2009)
 Relative atomic masses are expressed with five significant figures. For elements that have no stable nuclides, the value enclosed in brackets indicates the mass number of the longest-lived isotope of the element. However, three such elements (Tl, Fr and U) do have a characteristic terrestrial isotopic composition, and for these an atomic weight is tabulated.

Birzeit University---Chemistry Department

1st Hr. Exam

Chem. 141

1st. Sem.2014/2015

26/10/2014

Time: 80 Minutes

Instructors: Dr. Adil Alhidmeh (section 1)

Mr. Adi Qamhieh (section 2)

Dr. Zaki Hassan (Section 3)

Dr. Abdullatif Abuhijleh (Sections 4)

Student name Shorouq Odeh

Student No. 1110564

Student Section 1

Circle the correct answer

1. Express 96,342 m using 2 significant figures.

~~A) 9.60 x 10⁴ m~~

~~B) 9.6 x 10⁴ m~~

C) 9.60 x 10⁴ m

D) 9.6 x 10⁴ m

E) 96,000. m

9.6 x 10⁴

2. The area of large pizza is 176.7 in². Given that 1 inch = 2.54 cm, express this area in square centimeters (cm²)

A) 96.8 cm²

B) 448.8 cm²

~~C) 1140. cm²~~

D) 69.57 cm²

E) 27.39 cm²

3. The number 6.0448, rounded to 3 decimal places, becomes:

~~A) 6.045~~

B) 6.05

C) 6.044

D) 0.60448 x 10³

E) non of the above answers

4. Acetone boils at 56.1°C. What is the boiling point in degrees Fahrenheit?

- A) 159°F B) 133°F C) 101°F D) 69.0°F E) 43.4°F

5. Bromine is the only nonmetal that is a liquid at room temperature. Consider the isotope Bromine 81, $^{81}_{35}\text{Br}$. Select the combination which lists the correct atomic number, neutron number, and mass number, respectively.

- A) 35, 46, 81 B) 35, 81, 46
 C) 81, 46, 35 D) 46, 81, 35
E) 35, 81, 116

6. Which of the following compounds is ionic?

- A) PF_3 B) CS_2 C) CH_4 D) SO_2 E) MgCl_2

7. Which of the following gives the formula and the bonding for sodium oxide?

- A) NaO , ionic compound D) Na_2O , ionic compound
B) NaO , covalent compound E) Na_2O_2 , ionic compound
C) Na_2O , covalent compound

8. The compound, NaH_2PO_4 , is present in many baking powders. What is its name?

- A) sodium biphosphate D) sodium hydrophosphate ~~$\text{Na}_2\text{H}_2\text{PO}_4$~~
B) sodium hydrogen phosphate Na_2HPO_4 E) sodium dihydride phosphate
 C) sodium dihydrogen phosphate

9. What is the formula for Fe(III) oxide?

- A) FeO B) Fe_2O C) FeO_3 D) Fe_2O_5 E) Fe_2O_3

10. What is the name of PCl_3

- A) phosphorus chloride D) phosphorus trichloride
 B) phosphoric chloride E) trichlorophosphide
C) phosphorus trichlorate

11. What is the molecular mass of ammonium sulfate?

- A) 63.07 amu D) 128.11 amu
B) 114.10 amu E) 132.13 amu
C) 118.13 amu

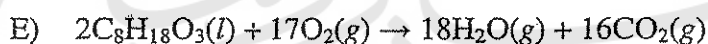
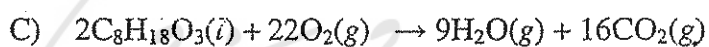
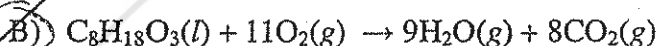
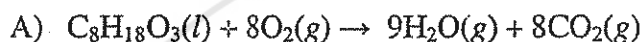
12. Calculate the number of moles in 17.8 g of the anti-acid magnesium hydroxide, $\text{Mg}(\text{OH})_2$.

- A) 3.28 mol B) 2.32 mol **C) 0.205 mol** D) 0.431 mol E) 0.200 mol

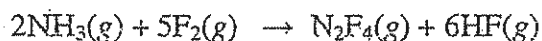
13. Calculate the mass of lead in 139 g of lead (II) nitrate, $\text{Pb}(\text{NO}_3)_2$.

- A) 107 g B) 90.8 g **C) 87.0 g** D) 83.4 g E) 62.6 g

14. Balance the following equation:



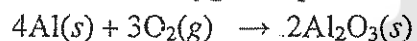
15. Ammonia will react with fluorine to produce dinitrogen tetrafluoride and hydrogen fluoride



How many moles of NH_3 are needed to react completely with 13.6 mol of F_2 ?

- A) 34.0 mol B) 27.2 mol C) 6.80 mol **D) 5.44 mol** E) 2.27 mol

16. Aluminum reacts with oxygen to produce aluminum oxide :



A mixture of 82.49 g of aluminum ($M = 26.98 \text{ g/mol}$) and 117.65 g of oxygen ($M = 32.00 \text{ g/mol}$) is allowed to react. Identify the limiting reactant and determine the mass of the excess reactant present in the vessel when the reaction is complete.

A) Oxygen is the limiting reactant; 19.81 g of aluminum remain.

B) Oxygen is the limiting reactant; 35.16 g of aluminum remain.

C) Aluminum is the limiting reactant; 16.70 g of oxygen remain.

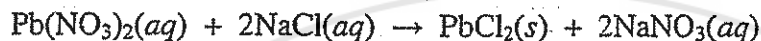
D) Aluminum is the limiting reactant; 35.16 g of oxygen remain.

E) Aluminum is the limiting reactant; 44.24 g of oxygen remain.

17. When 2.61 g of solid Na_2CO_3 is dissolved in sufficient water to make 250 mL of solution, the concentration of Na_2CO_3 is:

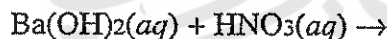
- A) 0.0985 M B) 10.4 M C) 0.205 M D) 0.0246 M E) 0.141 M

18. In the following reaction, what ions, if any, are spectator ions?



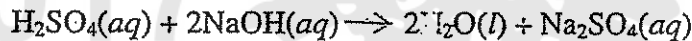
- A) $\text{Pb}^{2+}(\text{aq})$, $\text{Cl}^{-}(\text{aq})$ D) $\text{Na}^{+}(\text{aq})$, $\text{Cl}^{-}(\text{aq})$
 B) $\text{Na}^{+}(\text{aq})$, $\text{NO}_3^{-}(\text{aq})$ E) There are no spectator ions.
 C) $\text{Pb}^{2+}(\text{aq})$, $\text{NO}_3^{-}(\text{aq})$

19. Select the correct set of products for the following reaction.



- A) $\text{BaN}_2(\text{s}) + \text{H}_2\text{O}(\text{l})$ D) $\text{Ba}_2\text{O}(\text{s}) + \text{NO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$
 B) $\text{Ba}(\text{s}) + \text{H}_2(\text{g}) + \text{NO}_2(\text{g})$ E) No reaction occurs.
 C) $\text{Ba}(\text{NO}_3)_2(\text{aq}) + \text{H}_2\text{O}(\text{l})$

20. Automobile batteries use 3.0 M H_2SO_4 as an acid electrolyte. How much 1.20 M NaOH will be needed to neutralize 225 mL of the battery acid, H_2SO_4 ?



- A) 1.1 L B) 0.28 L C) 0.56 L D) 0.90 L E) 0.045 L

21. Select the precipitate that forms when aqueous lead(II) nitrate reacts with aqueous sodium sulfate.

- A) NaNO_3 B) Na_2NO_3 C) Pb_2SO_4 D) PbSO_4 E) PbS

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