Analytical Chemistry I

Dr. Mai Ramadan

Final Exam 2016

بسم الله الرحمن الرحيم

Qualitative analytical chemistry SS\ final exam

17.05.2016 Time: 100 min

Name: -----

الرجاء كتابة الاسم رباعيا بالعربية

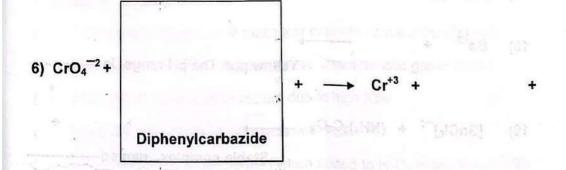
Q1	Q2	Q3	Q4	Q5	Q6	Q7	Total	Bonus
20	5	5	5	5	12	8	- 60	5

[I] Complete the following equations and the asked question: (20 P)

- 1) Sb₂S₅ + HCI (conc) +
- 3) $S_2O_3^{-2} + I_2$ +
- 4) Na⁺ + ______ (s)

White crystal

5)
$$NO_3^-$$
 + Fe^{+2} + NO + +



8) SCN

Dissolve in ether with bloody red color

9)
$$CrO_4^{-2} + H_2O_2 + \longrightarrow$$

Blue in ether Lewis structure

11)
$$Bi(OH)_3 + [Sn(OH)_4]^{-2}$$
 — (s) +

Arsenic mirror dissolves in -------- is a malfunction for test.

13) PbS + HNO₃

14) [AI(OH)₄] + NH₄+

15) Ba⁺² +

Yellow ppt. The pH range is--

 $[SnCl_6]^{-2} + (NH_4)_2C_2O_4$ 16)

Stable complex, named----

17) Pb+2 + OH

18) As₂S₃

Soluble complex

Thioarsenate ion

explanation, only <u>one</u> suggestion, write chemical formula: (5 P)
1) Detection of borate
2) Dissolution of HgS
3) Removal of nitric acid from a sample
4) Formation of Dragendorf's reagent
5) Precipitation of Sr ⁺² while Ca ⁺² remains soluble
6) Formula of Prussian blue
7) Separation of Na ⁺ and Mg ⁺²
8) Separation of As ₂ S ₃ and HgS
9) Precipitating and chelating agent of Ni ⁺²
10) Formula of brown ring
[III] Assign the following Statements with true (T) or false (F): (5 P)
() The P atom of sodium hypophosphite had +3 oxidation number.
() MgCO3 is not precipitated upon addition of ammonium carbonate.
() [Fe(CN) ₅ NO] ⁻² is used for detection of sulfite in a lewis acid base rxn.
() Limit test of arsenic is a pharmacopoieal comparison test for arsenic impurities in chemicals.
() HF reacts with silicate in glass test tubes to cause color changes.
() Upon addition of HCI to thiocyanate characteristic gas is evolved.
() NiS dissolves in acidic medium due to high Ksp.
() Tetracyanocuprate (I) ion reacts with H ₂ S.
() Permanganate is decolorized when added to H ₂ O ₂ in acidified medium.
() Sulfide, thiosulfate and sulfite evolved N ₂ gas when I ₂ /N ₃ is added.

No. 1	
[IV] Explain with chemical reaction the	following: (5 P)
with chemical reaction the	3 10110Ming. (2-7)
a- Copper coin test	
a copp	
	Spiles 10
	me the electronic of to relation
	The same that products a
The state of the s	end outsin 11to plants
b- Dissolution of As ₂ S ₅ (Only one sugges	stion)
D Discolation	The second secon
	removed galaxies of epice.
	The Gyrl medica to produce Scott Y
attraction of the state of the state of	
has emiliarly below to democratic elementary	Thereas, and passed for dis-
[V] Explain limit test using chloride as	S Avamala (E D)
Chemicals for reference tube:	s example. (5 P)
Chemicals for reference tube:	
Chemicals for sample tube:	and a kin phastic healt
	ellera ell'assai derivedo del l'
Reaction involved:	The agreement of
	Fairment and a Committee Committee
Sample is rejected when:	This replace
Comple is accented wh-	
Sample is accepted when:	
,a	

[VI] Select an ion which described in each case, then Explain with chemical reaction your selection and why you refused others: (12 P)

a) upon passage of H₂S in acidic medium a black ppt, which insoluble in ammonium poly sulfide and when NH₃ conc added a white ppt was formed.

1- Fe⁺²

2- Bi+3

3- Cd⁺²

b) Upon addition of iodide a brown colored solution was detected and when HCl (dil) added no ppt was formed but when H₂S passed to acidified solution ppt was formed.

1- Pb+2

2- Mn⁺²

3- Cu⁺²

c) Upon addition of acids no gas was evolved, but when iodine azide reagent was added an odorless gas evolved. When Ag⁺ added to acidified solution a white ppt formed.

1- Cyanide ion

2- Sulfide ion

3- Thiocyanate ion

Bonus Question: (5 P)

When HCI (dil) added or H₂S passed in acidic or basic buffered solution no ppt was formed. When Oxalate or fluoride added a white ppt formed and when chromate added to acetate buffered solution no ppt formed.

1- Ag⁺

2- Co+2

3- Hg⁺²

4- Ca⁺²

[VII] Describe only schematic how could the following ions be separated: Ag⁺, Pb⁺², Cu⁺², Bi⁺³, As⁺³, Sn⁺², Fe⁺², Ni⁺², Ca⁺², Na⁺, K⁺. (8 P)

Good luck Dr. Mai Ramadan