

EXP. NUMBER	EXPERIMENT/SUBJECT	DATE
NAME	LOCKER/DESK NO.	COURSE & SECTION NO.

**CATION GROUP III - PART 2**  
**ANALYTICAL PROCEDURE FOR CATION GROUP III**

PURPOSE:

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 the purpose  
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MATERIALS:

APPARATUS	GLASSWARE	CHEMICALS	
Universal pH indicator	50mL beakers	48.2 g/L FeCl <sub>3</sub> (aq)	6M HNO <sub>3</sub> (aq)
paper	25mL beakers	90.0 g/L AlCl <sub>3</sub> (aq)	Concentrated HNO <sub>3</sub> (aq)
Hot plate	Test tube with	50.0g/L Co(NO <sub>3</sub> ) <sub>2</sub> (aq)	3% H <sub>2</sub> O <sub>2</sub> (aq)
Test tube rack	stoppers	50.0 g/L Ni(NO <sub>3</sub> ) <sub>2</sub> (aq)	6M H <sub>2</sub> C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> (aq)
Disposable pipet	Glass stirring rod	36.0g/L MnCl <sub>2</sub> (aq)	Concentrated NH <sub>3</sub> (aq)
Centrifuge		45.6 g/L Zn(NO <sub>3</sub> ) <sub>2</sub> (aq)	1.0M KSCN (aq)
		51.0 g/L CrCl <sub>3</sub> (aq)	NaBiO <sub>3</sub> powder
		Deionized water	0.3M K <sub>4</sub> Fe(CN) <sub>6</sub> (aq)
		Concentrated HCl (aq)	NaC <sub>2</sub> H <sub>3</sub> O <sub>2</sub>
		6M HCl (aq)	120g/L BaCl <sub>2</sub> (aq)
		6M NaOH (aq)	Acetone, Aluminon

SAFETY:

DISPOSAL:

FLOW CHART

→ new page!  
 → use a landscape format (suggestion)

SIGNATURE	DATE	WITNESS/TA	DATE
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PROCEDURE:

OBSERVATIONS

Procedure I: Sample Preparation

Preparation of Known Sample:

Mix together 6 drops of the following test solutions:  $Fe^{3+}$ ,  $Al^{3+}$ ,  $Co^{2+}$ ,  $Ni^{2+}$ ,  $Mn^{2+}$  in a beaker

The solution is greenish-gray

Preparation of Unknown Sample:

Mix 4/5 of unknown and 2mL conc. HCl in a beaker.  
Heat and stir  
Transfer approx. 1mL of soln to 50 mL beaker

The Mixture is dark brown

als

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PROCEDURE	OBSERVATIONS
<p><u>Procedure II: Precipitate and Separation of Subgroups of Group III</u></p> <p><u>A) Separation of Aluminum subgroup</u> (Cr, Al, &amp; Zn)</p> <p>Add 6M NaOH soln until basic to universal pH paper</p> <p>Add 8 drops excess NaOH</p> <p>Add 10-15 drops of fresh 3% slowly.</p> <p>Heat, mix, centrifuge</p> <p><u>Known Equations</u></p>	<p><u>Known:</u></p> <p>pH=10 to universal indicator paper A 1 1/2 cm pea size black precipitate formed The Supernatant is medium yellow</p> <p><u>Unknown:</u></p> <p>pH=10 to universal indicator paper A lima bean sized precipitate formed dark brown in color The Supernatant is colorless</p>

10/2/1107

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Style # 1

style #1

# Confirmation test of a cation in the unknown

PROCEDURE	OBSERVATIONS
<p><u>Procedure III: Analysis of Nickel subgroups</u></p> <p>A) Treatment of the <math>\text{Co}(\text{NH}_3)_4^{3+}</math>, <math>\text{Ni}(\text{NH}_3)_4^{2+}</math> supernatant from Procedure II, Part B</p> <p>Divide the solution into two separate equal portions</p> <p>B) Confirmation Test for <math>\text{Co}^{2+}</math> - Treatment of One-Half of <math>\text{Co}(\text{NH}_3)_4^{3+}</math>, <math>\text{Ni}(\text{NH}_3)_4^{2+}</math> Soln</p> <p>Add 6M <math>\text{HC}_2\text{H}_3\text{O}_2</math> until acidic and 10 drops of 1.0 M KSCN solution</p> <p>Put 1ml of acetone into test tube</p>	<p><u>Known:</u></p> <p>pH = 4 to universal indicator paper acetone layer turned medium blue</p> <p><u>Unknown:</u></p> <p>pH = 4 to universal indicator paper acetone layer turned white.</p> <p><math>\therefore</math> Cobalt is absent</p>

oo

This statement is only for your unknown

10/4/10 oo

Equations

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Style #1

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PROCEDURE

OBSERVATIONS

Procedure II: Separation of Aluminum subgroup

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style 2

EXP. NUMBER	EXPERIMENT/SUBJECT	LOCKER/DESK NO.	COURSE & SECTION NO.
NAME		Locker/Desk No.	
separation Procedure		Example	

PROCEDURE	OBSERVATIONS	
Procedure II: Precipitate and Separation of subgroups of Group III		
A) Separation of Aluminum subgroup (Cr, Al, Zn) Add <del>8 drops</del> 6M NaOH soln. until basic to universal pH paper  Add 8 drops excess NaOH  Add 10-15 drops of fresh 3% H <sub>2</sub> O <sub>2</sub> slowly  Heat, mix, centrifuge	Known	Unknown
	<del>Cloudy</del> Powdery brown ppt. formed  precipitate darkened to dark brown  supernatant is medium yellow	powdery brown ppt. form slightly reddish in tone  precipitate darkened to dark brown, gas <sup>is</sup> produce  supernatant is colorless
Known Equations:		10/4/10
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	style #2	

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