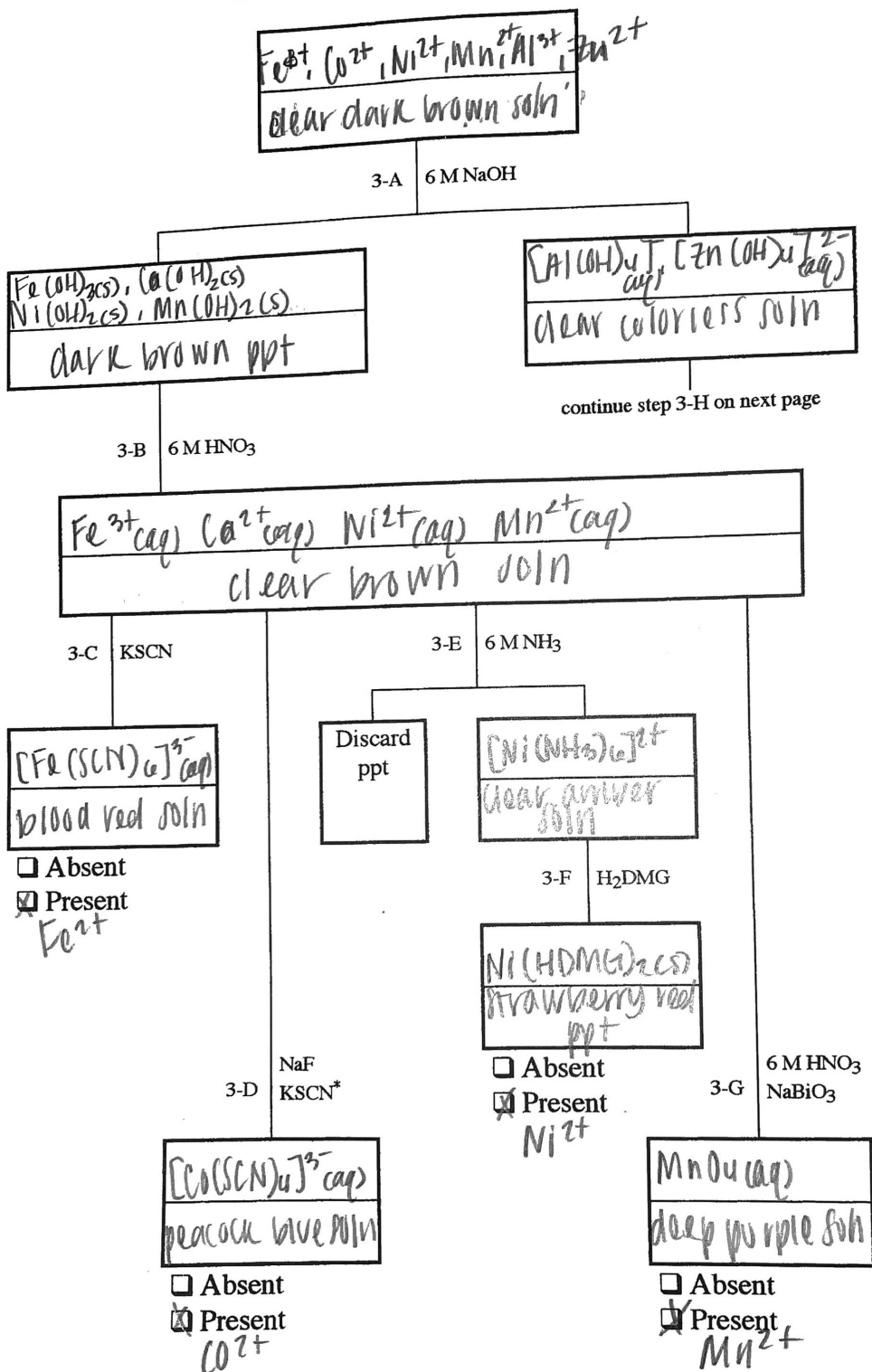


GROUP 3 KNOWN FLOWCHART



Group 3 Cations: Fe^{3+} , Co^{2+} , Ni^{2+} , Mn^{2+} , Al^{3+} , Zn^{2+}

In-Class Exercise

Grade: _____ / 40 pts

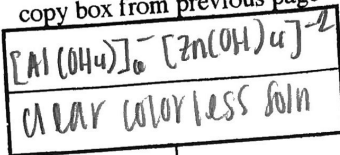
Name: _____

GROUP 3 KNOWN SOLUTION DATA SHEET

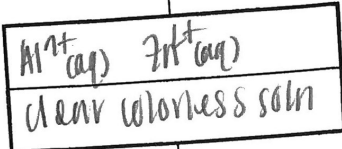
Procedure Number and Reagent	Observations	Possible Formulas		Inferences
		Solids	Solns	
3A-1	dark brown ppt	$\text{Fe}(\text{OH})_3$, $\text{Co}(\text{OH})_2$, $\text{Ni}(\text{OH})_2$, $\text{Mn}(\text{OH})_2$		both may contain $\text{Fe}(\text{OH})_3$, $\text{Co}(\text{OH})_2$, $\text{Ni}(\text{OH})_2$, $\text{Mn}(\text{OH})_2$
3A-2	clear (colorless) soln		$[\text{Al}(\text{OH})_4]^-$, $[\text{Zn}(\text{OH})_4]^{2-}$	may contain $[\text{Al}(\text{OH})_4]^-$ or $[\text{Zn}(\text{OH})_4]^{2-}$
3B	clear brown soln		Fe^{3+} , Co^{2+} , Ni^{2+} , Mn^{2+}	may contain Fe^{3+} , Co^{2+} , Ni^{2+} , Mn^{2+}
3C	blood red soln		$[\text{Fe}(\text{SCN})_6]^{3-}$	may contain $[\text{Fe}(\text{SCN})_6]^{3-}$
3D	poucouc blue soln		$[\text{Co}(\text{SCN})_4]^{3-}$	may contain $[\text{Co}(\text{SCN})_4]^{3-}$
3E	clear amber soln		$[\text{Ni}(\text{NH}_3)_6]^{2+}$	may contain $[\text{Ni}(\text{NH}_3)_6]^{2+}$
3F	strawberry red ppt	$\text{Ni}(\text{H}_2\text{O})_6^{2+}$		may contain $\text{Ni}(\text{H}_2\text{O})_6^{2+}$
3G	deep purple soln		MnO_4^-	may contain MnO_4^-

GROUP 3 KNOWN FLOWCHART
(Continued)

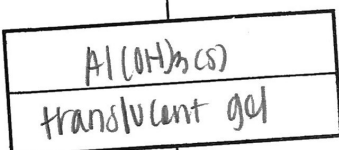
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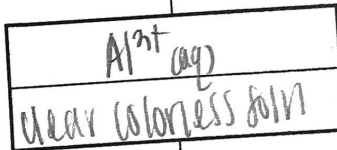
3-H 6 M HNO_3



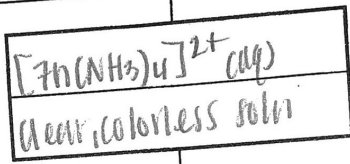
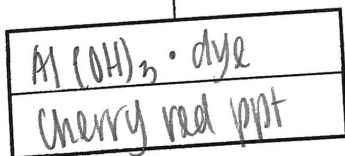
3-I 6 M NH_3



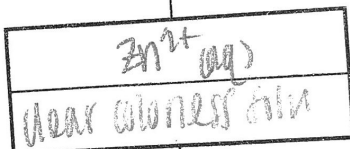
3-J 6 M HNO_3



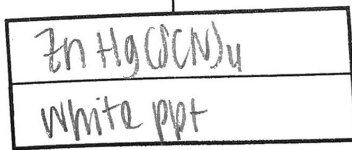
3-K Aluminon Reagent
6 M NH_3



3-L 6 M HCl



3-M Zinc Reagent



Absent
 Present
 $\text{Al}^{3+}(\text{aq})$

Absent
 Present
 $\text{Zn}^{2+}(\text{aq})$

GROUP 3 KNOWN SOLUTION DATA SHEET
(Continued)

Procedure Number and Reagent	Observations	Possible Solids	Formulas Solns	Inferences
3H	clear colorless soln	/	Al ³⁺ (aq) Zn ²⁺ (aq)	may contain Al ³⁺ (aq) and Zn ²⁺ (aq)
3I-1	translucent gel	Al(OH) ₃	/	may contain Al(OH) ₃
3I-2	clear colorless soln	/	[Zn(NH ₃) ₄] ²⁺	may contain [Zn(NH ₃) ₄] ²⁺
3J	clear colorless soln	/	Al ³⁺ (aq)	may contain Al ³⁺
3K	cherry red ppt	Al(OH) ₃ · dye	/	may contain Al(OH) ₃ · dye
3L	clear colorless soln	/	Zn ²⁺ (aq)	may contain Zn ²⁺
3M	white ppt	ZnHg(SCN) ₄	/	may contain ZnHg(SCN) ₄