

جامعة الانبار

كلية : الصيدلة

قسم : الكيمياء الصيدلانية

اسم المادة باللغة العربية: الكيمياء التحليلية

اسم المادة باللغة الإنكليزية: Analytical Chemistry

المرحلة: الأولى

التدريسي: م.م. سحر فائق عبد صالح

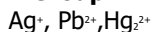
عنوان المحاضرة باللغة العربية: الكيمياء التحليلية العملي التجربة الأولى

عنوان المحاضرة باللغة الإنكليزية: Practical Analytical Chemistry (1)

Exp. 1

Identification of Group I cations

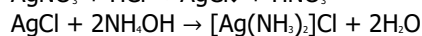
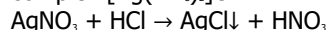
Group 1



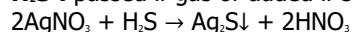
The reagent of the group is dil. HCl, the ions precipitate as chlorides. The chlorides of other groups are soluble.

Silver Ag^+

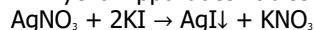
Dil. HCl : white ppt. turns to black in the presence of light. The ppt. dissolves in NH_4OH forming the complex $[\text{Ag}(\text{NH}_3)_2]\text{Cl}$.



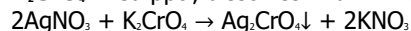
H_2S : passed if gas or added if solution, black ppt., dissolves in hot dil. HNO_3 .



KI : yellow ppt. doesn't dissolve in acids or ammonia solution.



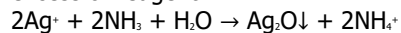
K_2CrO_4 : red ppt., dissolves in dil. HNO_3 and NH_4OH .



NaOH : brown ppt., dissolves in dil. HNO_3 and NH_4OH , doesn't dissolve in excess of reagent.

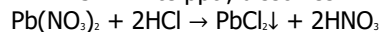


NH_4OH : white ppt. of silver hydroxide, turns to black due to the formation of silver oxide. The ppt. dissolves in excess of reagent.

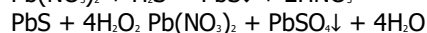
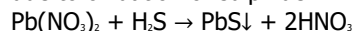


Lead Pb^{2+}

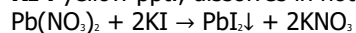
Dil. HCl : white ppt., dissolves in hot water, and appears again on cooling.



H_2S : passed if gas or added if solution, black ppt., dissolves in hot dil. HNO_3 , on addition of H_2O_2 white ppt. formed due to oxidation of sulphide.



KI : yellow ppt., dissolves in hot water to a colourless solution, on cooling, the yellow ppt. appears again.



K₂CrO₄ : yellow ppt., dissolves in HNO₃ and NaOH.
 $\text{Pb}(\text{NO}_3)_2 + \text{K}_2\text{CrO}_4 \rightarrow \text{PbCrO}_4\downarrow + 2\text{KNO}_3$

NaOH : white ppt., dissolves in excess of reagent.
 $\text{Pb}(\text{NO}_3)_2 + 2\text{NaOH} \rightarrow \text{Pb}(\text{OH})_2\downarrow + 2\text{NaNO}_3$

NH₄OH : white ppt. doesn't dissolve in excess of reagent.
 $\text{Pb}(\text{NO}_3)_2 + 2\text{NH}_4\text{OH} \rightarrow \text{Pb}(\text{OH})_2\downarrow + 2\text{NH}_4\text{NO}_3$

Mercurous Hg₂²⁺

Dil. HCl : white ppt. doesn't dissolve in dil. acids or hot water.
 $\text{Hg}_2(\text{NO}_3)_2 + 2\text{HCl} \rightarrow \text{Hg}_2\text{Cl}_2\downarrow + 2\text{HNO}_3$

H₂S : passed if gas or added if solution, black ppt. of HgS and Hg.
 $\text{Hg}_2(\text{NO}_3)_2 + \text{H}_2\text{S} \rightarrow \text{HgS}\downarrow + \text{Hg}\downarrow + 2\text{HNO}_3$

KI : green-yellow ppt., dissolves in excess of reagent forming black ppt. of Hg.
 $\text{Hg}_2(\text{NO}_3)_2 + 2\text{KI} \rightarrow \text{Hg}_2\text{I}_2\downarrow + 2\text{KNO}_3$
 $\text{Hg}_2\text{I}_2 + 2\text{KI} \rightarrow \text{K}_2(\text{HgI}_4) + \text{Hg}\downarrow$

K₂CrO₄ : brown ppt., turns to red crystals on heating.
 $\text{Hg}_2(\text{NO}_3)_2 + \text{K}_2\text{CrO}_4 \rightarrow \text{Hg}_2\text{CrO}_4\downarrow + 2\text{KNO}_3$

NaOH : black ppt. doesn't dissolve in excess of reagent, dissolves in dil. HNO₃.
 $\text{Hg}_2(\text{NO}_3)_2 + 2\text{NaOH} \rightarrow \text{Hg}_2\text{O}\downarrow + 2\text{NaNO}_3 + \text{H}_2\text{O}$

NH₄OH : black ppt. of Hg and HgNH₂Cl.
 $\text{Hg}_2\text{Cl}_2 + 2\text{NH}_4\text{OH} \rightarrow \text{HgNH}_2\text{Cl}\downarrow + \text{Hg}\downarrow + \text{NH}_4\text{Cl} + 2\text{H}_2\text{O}$