

Name: _____

Qualitative Analysis: Quiz 3

Multiple Choice

- ___ 1. Unknown I was treated with six drops of HCl. A precipitate was observed. Which ion or group of ions were shown to be absent by this test? (1) Fe; (2) Hg; (3) Cr; (4) Ag; (5) Pb; (6) all of the above; (7) Hg, Ag, and Pb; (8) no ions were shown to be absent.
- ___ 2. Unknown II was treated with six drops of HCl. A precipitate was observed. Which of the following best describes the ion or group of ions that could be present? (1) Fe; (2) Hg; (3) Cr; (4) Ag; (5) Pb; (6) Fe, Ag, and Co; (7) Hg, Ag, and Pb; (8) none of the above.
- ___ 3. The precipitate obtained in question 1 was mixed with hot water and heated for 5 minutes. The precipitate was observed to completely dissolve. One can deduce from this observation that (1) silver and mercury were absent and lead is probably present; (2) lead is definitely present and silver and mercury are absent; (3) lead is absent and silver and mercury are probably present; (4) lead, silver and mercury are all absent since these ions form insoluble chlorides and would not have dissolved.
- ___ 4. Which of the following is the confirmatory test for lead? (1) adding concentrated ammonia (15 M) and observing that lead chloride dissolves; (2) adding cobalt nitrate and observing a yellow precipitate of lead nitrate; (3) adding potassium chromate and observing a yellow precipitate of lead chromate; (4) adding concentrated ammonia (15 M) and observing a precipitate of lead chloride; (5) adding HCl and observing a precipitate of lead chloride; (6) none of the above.
- ___ 5. Unknown III was treated with six drops of HCl and centrifuged. A precipitate was not observed. Which of the following best describes the ion or group of ions that are definitely absent? (1) Fe; (2) Hg; (3) Cr and Fe; (4) Ag; (5) Pb; (6) Cr, Al, and Ag; (7) Hg, Ag, and Pb.
- ___ 6. Hot water was mixed with the precipitate obtained from question 1. The solid remaining was treated with concentrated ammonium hydroxide (15 M). A black residue was not formed. Which of the following ions has been confirmed to be absent by this test? (1) Hg; (2) Al; (3) Cr; (4) Pb; (5) Ag; (6) Fe; (7) no ions were confirmed to be absent; (8) unable to determine from the observations made.
- ___ 7. The confirmatory test for iron is (1) adding KSCN solution and observing a blue color; (2) adding NaF solution and observing a red color; (3) adding KSCN solution and observing a red color; (4) adding HCl and observing a white precipitate; (5) none of the above.
- ___ 8. The confirmatory test for Co is (1) adding KSCN and observing a red color; (2) adding KSCN, NaF, and ethanol and observing a blue color; (3) adding potassium chromate and observing a yellow precipitate; (5) a yellow color after heating with hydrogen peroxide and 6 M NaOH

- ___ 9. The supernate obtained in question 5 was treated with concentrated ammonium hydroxide and 2M ammonium chloride. A precipitate was observed. Which of the following is most correct? (1) Fe is definitely present; (2) Al is definitely present; (3) Cr is definitely present; (4) either Al or Fe or Cr or any combination thereof are present; (5) Al, Fe, and Cr are all present; (6) Al, Fe, and Cr are all absent; (7) Ni and Co are definitely present.
- ___ 10. A solution was known to contain both Ag^{1+} ions and Ni^{2+} ions? Which of the following could be added to separate them in such a way that one ion would end up in a precipitate, while the other remained in solution. (1) HCl ; (2) H_2SO_4 ; (3) K_2CrO_4 ; (4) NH_4OH ; (5) none of the previous substances could separate these ions.
11. How would you separate PbCl_2 from HgCl ?
12. An unknown was analyzed and found to contain only the Pb^{2+} ion. Draw the flow diagram, complete with observations, that would have been observed by the student.