# CHEMISTRY 235 EXPERIMENT 9
# QUALITATIVE ANALYSIS

## *METHOD AND RESULTS*

You are provided with three compounds each containing one of the following anions $S^{2-}$, $SO_3^{2-}$, $SO_4^{2-}$, $S_2O_3^{2-}$, $S_2O_8^{2-}$, and $NO_3^-$. Perform the following tests and determine which anion is present in each of the compounds A, B, C, D, E and F. Write down any relevant observations and any inferences which may be drawn and, where appropriate, equations for the reactions, in the appropriate column. When a gas is evolved perform a confirmatory test to identify the gas unambiguously. Note that sulfites, especially, are susceptible to air oxidation during storage.

### COMPOUND A

| TEST | OBSERVATIONS | DEDUCTIONS |
|---|---|---|
| 1) Add some dil. HCl to solid A. Warm. | | |
| 2) Prepare a solution of A and use it for the following tests. Use a fresh portion for each test unless otherwise instructed. | | |
| a) Add $BaCl_2$(aq), then dil. HCl or dil. $HNO_3$. Warm. | | |
| b) Add $AgNO_3$(aq). Allow to stand for a few mins. | | |
| c) Add $Pb(NO_3)_2$(aq) or $Pb(CH_3COO)_2$(aq) then dil. $HNO_3$. | | |
| d) Add some A(aq) to a mixture of dil. $H_2SO_4$ and $KMnO_4$(aq). | | |
| e) Add some A(aq) to $K_2Cr_2O_7$(aq) acidified with a few drops of dil. $H_2SO_4$. | | |



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| TEST | OBSERVATIONS | DEDUCTIONS |
|---|---|---|
| f) Add some A(aq) to $I_2$(aq). | | |

## COMPOUND B

| TEST | OBSERVATIONS | DEDUCTIONS |
|---|---|---|
| Prepare a soln. of B and use it for the following tests. | | |
| a) Add $BaCl_2$(aq), then dil. $HNO_3$. | | |
| b) Add $Pb(NO_3)_2$(aq) or $Pb(CH_3COO)_2$(aq). Divide the result into 2 parts and proceed as follows: | | |
| i) Warm 1st part. | | |
| ii) Add dil. $HNO_3$ to 2nd. part. | | |
| c) Add some B to a mixture of dil. $H_2SO_4$ and $KMnO_4$(aq). | | |
| d) Add some B to $I_2$(aq). | | |
| e) Add some B to KI(aq). | | |

## COMPOUND C

| TEST | OBSERVATIONS | DEDUCTIONS |
|---|---|---|
| 1) Add dil. HCl or dil. $H_2SO_4$ to solid C. Warm. | | |
| 2) Add a few drops conc. $H_2SO_4$ to solid C. Warm. | | |
| 3) Make a soln. of C and use it for the following tests. | | |
| a) Add excess $AgNO_3(aq)$ | | |
| b) Add $I_2(aq)$. | | |
| c) Add $Pb(NO_3)_2(aq)$ and boil the result. | | |
| d) Add $FeCl_3(aq)$. | | |
| e) Mix some C(aq) with ammonium molybdate soln., then carefully add conc. $H_2SO_4$ down the side of the test tube. | | |



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