**Southern New Mexico-West Texas Chemical Olympiad Competition**

**Instructions for Qualitative Analysis Team Experiment**

**Summary:** Each team will be given nine dropper bottles, each containing an aqueous solution of one of the compounds listed below. The members of the team determine which solution is in each bottle by a procedure limited to mixing the solutions. (Students are not to physically touch, smell or taste the solutions). ***Each team is supplied with a nine well spot plate, a wash bottle and the data sheet shown on the following page.***

***Winning teams (1st, 2nd and 3rd place in each of the divisions) will be selected on the basis of the time required to make the correct assignments***.

Substances in unknown aqueous solutions (one per dropper bottle)

* 0.5 M MgCl­2
* 0.03 M Fe(NH4)2(SO4)2 in 0.5 M H2SO4
* 0.01 M KMnO4
* 0.5 M BaCl2
* 0.8 M K2CO3
* 1.0 M Na2SO4
* 0.1 M KSCN
* 1.0 M NaOH
* 1.0 M HNO3

Note: The compound Fe(NH4)2(SO4)2 is iron(II) ammonium sulfate or ferrous ammonium sulfate. The iron is in the +2 oxidation state.

New Mexico – West Texas Chemistry Olympiad

**Qualitative Analysis Scoring Sheet**

Student Names: (1) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ID:\_\_\_\_\_\_\_\_\_\_\_\_\_

 (2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ID:\_\_\_\_\_\_\_\_\_\_\_\_\_

 (3) \_­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ID:\_\_\_\_\_\_\_\_\_\_\_\_\_

High School: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| **Substance** | **Trial 1****3-digit Code** | **Trial 2****3-digit Code** | **Trial 3****3-digit Code** |
| MgCl2 |  |  |  |
| Fe(NH4)2(SO4)2 |  |  |  |
| KMnO4 |  |  |  |
| BaCl2 |  |  |  |
| K2CO3 |  |  |  |
| Na2SO4 |  |  |  |
| KSCN |  |  |  |
| NaOH |  |  |  |
| HNO3 |  |  |  |
| **Time** |  |  |  |

Total Time (seconds): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Note: The total time is the sum of each trial time up through the first correct trial plus a 60 second penalty for each incorrect answer.