**CLASS SET of INSTRUCTIONS - Do not write on this paper**

**Was it Suicide, Murder or an Accident?**

Analysis of Over-the-Counter Drugs­©

A Forensic Toxicology and Chemistry Lab

**Crime Scene:** Jessica Scott was found unconscious in her bedroom. Her sister explained to police that she had not talked to her in several days and when Jessica did not answer her phone, her sister decided to go check on her. Efforts were made to resuscitate her and Jessica was rushed to the emergency room. Unfortunately she died on route to the hospital. During the autopsy, the pathologist found large amounts of white powder in her stomach. He sent the contents to the department’s forensic toxicologists. The powder contents were dried and are ready to be analyzed. It is your job to determine what was the white powder in her stomach? Was it an overdose? Was she poisoned?

**Objectives:** Learn to analyze and identify over the counter (OTC) drugs such as pain relievers and antacids. Test physical and chemical properties of actual OTC drug samples and analyze the unknown white powder that was found in the victim’s stomach.

**Materials:**

|  |  |
| --- | --- |
| 2 Reaction Spot plates | Goggles |
| Cotton swab (for cleaning wells) | Tooth picks (for stirring) |
| 0.5 M HCL | Ferric nitrate (FeNO3) |
| pH papers | pH indictor solution and color chart key |
| Sm beaker of Distilled water | 4 Clean pipettes |
| Aspirin | Tylenol© |
| Bufferin© | Excedrin© |
| Advil© | Crime Scene Powder |

**Procedure:** Read the procedures for each test carefully and place your results in the data sheet provided. Label each well as per teacher instructions.

Part 1: Pain Relievers Tests

* Row A- Appearance: place a few granules of the powdered Aspirin to each of the four wells of column 1 of the well plate. Repeat for each of the other pain relievers including the crime scene powder. Make detailed observations about the appearance of each powder, noting color and consistency. Record your observations in Row A of Data Table 1.
* Solubility: Using a clean dropper, add 10-15 drops of distilled water to each of the powders across Row A. Stir each well with a separate/clean toothpick. Observe any physical or chemical changes that occur. Ex: Fizzing or dissolving. Use the following as a guide:
  1. If solution turns clear, then the drug is *soluble*
  2. If solution is cloudy, then the drug is *slightly soluble*
  3. If the powder remains unchanged, and there is a thick white precipitate, then the drug is *insoluble.*
  4. Record this in of Data table
* Row B- Acidity/pH: Use pipette and add 10 drops of distilled water to each of the powders in Row B. STIR each with clean toothpick. Add 3-4 drops of pH indicator solution to each well. Record the color of each solution in data table. Be specific. Determine the pH value of the solution by comparing the color to the color chart. Let wells sit for 10- 15 mins. Check for any color changes. Now determine accurate pH by using the pH strips. Compare the pH of each powder and record in data chart.
* Row C- Reaction to HCL (Simulated Stomach Acid): Add 10 drops of HCl solution to each well in Row C. Stir well. Observe any reactions (fizzing or solubility) and record in data table 1. Determine pH by using pH strips. Record this in the data table 1.
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* Row D- Reaction with Ferric Nitrate: Add 10 drops of ferric nitrate solution to each powder in row D. Stir each with a clean toothpick. Observe any reaction and/or color changes and record in data table.
* Compare the crime scene results with the known pain relievers. Do not clean plate until you are confident with your results and can determine which pain relievers might be found in the powder.

**Part II- Antacid Tests**

* Place a few granules of powdered Alka-Seltzer antacid into each of four wells of Column 1. Repeat with each of the other antacids as well as the crime scene powder.
* Row A- Appearance: Make detailed observations about the appearance of each powder, noting color and consistency. Record your observations in Row A of Data Table 2.
* Solubility: Using a clean dropper, add 10-15 drops of distilled water to each of the powders across Row A. Stir each well with a separate/clean toothpick. Observe any physical or chemical changes that occur. Ex: Fizzing or dissolving. Use the following as a guide:
  1. If solution turns clear, then the drug is *soluble*
  2. If solution is cloudy, then the drug is *slightly soluble*
  3. If the powder remains unchanged, and there is a thick white precipitate, then the drug is *insoluble.*
  4. Record this in of Data table 2
* Row B- Acidity/pH: Use pipette and add 10 drops of distilled water to each of the powders in Row B. STIR each with clean toothpick. Add 3-4 drops of pH indicator solution to each well. Record the color of each solution in data table. Be specific. Determine the pH value of the solution by comparing the color to the color chart. Let wells sit for 10- 15 mins. Check for any color changes. Now determine an accurate pH using pH strips. Compare the pH of each powder and record in data table 2.
* Row C- Reaction to HCL (Simulated Stomach Acid): Add 10 drops of HCl solution to each well in Row C. Stir well. Observe any reactions (fizzing or solubility) and record in data table 2. Determine the pH by using pH strips. Record this in the data table 2.
* Row D- Reaction with Ferric Nitrate: Add 10 drops of ferric nitrate solution to each powder in row D. Stir each with a clean toothpick. Observe any reaction and/or color changes and record in data table.
* Compare the crime scene results with the known Antacids. Do not clean plate until you are confident with your results and can determine which Antacid might be in the powder.