

## Comparitive Analysis of unknown substances

In order to determine the composition of an unknown substance, it is necessary to compare it to well known substances. Chemical and physical tests can be carried out on the known and unknown to make a comparison. Organic compounds can also be tested.

There are a number of white powders which are commonly available which may be purchased over the counter or as prescription medicine. Use the following powders: Alka seltzer (for indigestion), Aropax (sleeping powder), Diazepam (Muscle relaxant), Amoxicillin (antibiotics) and Reznik (Rat poison) and perform each of the following 5 tests noting the reaction of each powder. The white powder from the crime scene can then be tested and identified by comparison with the reactions of the other powders. Record all your results in a clear table.

### **Test 1: Appearance**

Use a stereo microscope to describe and draw the appearance of the powder crystals - size, shape and colour.

### **Test 2: Solubility and pH**

Put a small sample of each powder in individual test tubes and add approx. 3ml of water. Shake for about 30 secs. Is the powder soluble? Describe the appearance of the substance. Use universal indicator to test the pH of half the liquid and compare the colour to the pH chart.

### **Test 3: Reaction with acid**

Put a small sample of each powder in individual test tubes. Add a few drops of 0.5M Hydrochloric Acid and describe the reaction.

### **Test 4: Heating**

Line a crucible with aluminium foil. Put a small sample of each powder in the crucible and place it in a triangle supported by a tripod. Heat with a Bunsen for 45 seconds or until a change is observed. Describe appearance in table.

### **Test 5: Presence of Starch**

Use the other half of the liquid from the tubes from Test 2 (tubes with powder and water). Add 3 drops of iodine to each tube. Describe and changes. Iodine turns blue/ black in the presence of starch.

### **Test 6: Flame test**

Place a small sample of each powder on a loop of wire and then in the flame of a bunsen burner. Observe the colour of the naked flame.