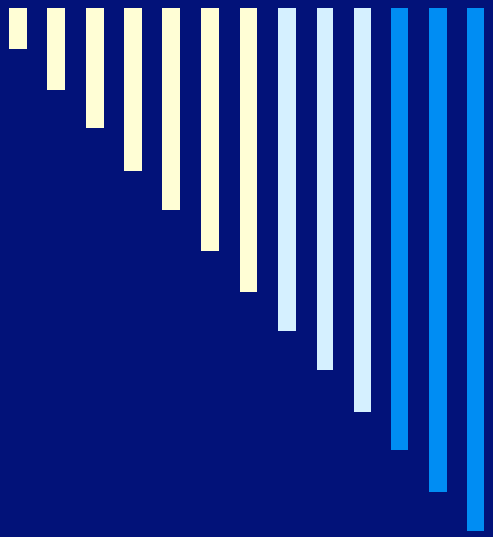

Forensic Science

A lesson on Glass Identification

Introduction

- Glass fragments can be used as evidence to help place a suspect at the scene of the crime.
- Because different types of glass has different physical characteristics, types of glass can be distinguished from one another.
- For example, chips of glass from a broken window may fall onto clothes, shoes, hair etc.

Further Identification

- A Forensic Scientist can identify these chips as part of a broken window
- Similarly parts of the broken headlight found at the crime scene of a hit-and-run can be used to identify the suspected vehicle.

Composition of Glass

- Glass is a hard, brittle substance made of silicon dioxide, lime, soda and oxides of metals
- The metal oxides found in most window glass are sodium, calcium, magnesium and aluminum. Automobiles headlights and other heat-resistant types of glass, such as Pyrex, contains Boron Oxides.

Safety Glass

- Broken glass can be sharp and dangerous.
- This is why automobile manufacturers use tempered and safety glass in vehicles.
- Tempered glass is made strong by heating and cooling process that introduces stress to the glass surface.
- When tempered glass breaks, it fragments into small squares that do not have sharp edges. Therefore, tempered glass is not so dangerous as other types of glass.
- Therefore, tempered glass is used in the side and rear windows of cars and trucks.

Safety Glass: (Continued)

- Windshields of laminated or safety glass.
- This type of glass is strong and break resistant because it is made by sandwiching of plastic between two pieces of ordinary window glass.

Different Densities for Different Glass.

- Forensics use the physical properties of glass to associate one type of glass fragment with another.
- One of these physical properties is Density. Because different types of glass contain different combinations of metal oxides, they have different Densities.

Density

- Density refers to material's mass per unit volume, and can be summarized into the formula:
- **D = M / V**
- The density of a substance remains constant, no matter what the size of the substance. Thus, density of glass can be used to help identify it.

A Simple Three Step method for determining density of the sample is:

- Weigh the sample and find its mass.
- Determine the volume of the sample.
- Divide the mass of the sample by its volume.
- For Example:
- 2 Cans of soda, 1 Coke and 1 Diet Coke. The Volume of both cans is measured to be ~255ml. The Mass of the Coke Can is _____ and the Mass of the Diet Coke can is _____.
- Knowing that the density of water is 1.0 g/ml, determine the density of the soda cans? Can you tell me which can will float in water?

Thank you for your attention

- Please refer to the plan of the week and or visit our website: http://wardisiani.tripod.com for upcoming assignments and experiments ☺