

Activity 1 Determining Density

Broken soda-lime glass was found at a crime scene. Police find bits of glass in the cuff of a suspect's pant leg. If the glass found on the suspect is the same as the glass found at the crime scene, then there is evidence to support the assertion that the suspect was at the crime scene. It is your job to determine if the glass should be examined more carefully to determine a definitive link.

The quickest way to determine what type of glass was recovered is to use one of the substances intrinsic properties, density. To determine the density of a substance you must measure both the mass of an object and the volume of the same object. The data that you collected is tabulated below. Should you recommend further analysis or not?

First you determined the mass of your sample. You placed a weighing boat on the balance and its mass was 0.501 g

After adding the sample of glass to the weighing boat, you determined their combined mass: 1.057 g

To determine the volume of the sample you submerged the sample in water that had been placed in a graduated cylinder. The water originally occupied a volume of 3.30 mL. With the added bit of glass, the level rose to 3.51 mL.

Glass	density g/cm ³
96% Silica (porous)	1.50
Lithia potash borosilicate	2.13
potash borosilicate	2.16
soda alumina borosilicate	2.17
96% Silica	2.18
Silica (99.9% fused)	2.20
borosilicate	2.23
Alkali strontium	2.26
alkali barium borosilicate	2.27
borosilicate	2.28
alkali borosilicate	2.29
soda-lime	2.47
alkali zinc borosilicate	2.57
alkali barium (optical)	2.60
alkali barium	2.64
baria alumina borosilicate	2.76
barium-alumina borosilicate	2.96
potash soda lead	3.05
lead zinc borosilicate	3.80
lead borosilicate	5.46