

3.2 Properties of plastics (2) – Determination of the density of plastics

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interTESS (Version 13.12 B214, Export 2000)

Task

Task

Which properties of plastics can be examined? (2)

Determine the density of some plastic materials.



Use the space below for your own notes.

Logged in as a teacher you will find a button below for additional information.

Material

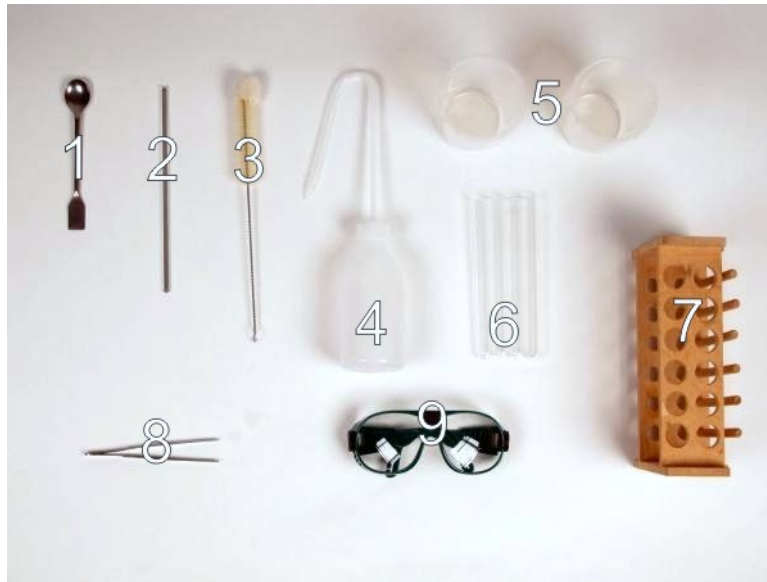
Material from "TESS Chemistry Set Polymer Chemistry" (Order No. 15305-88)

Position No.	Material	Order No.	Quantity
1	Spoon, special steel, $l = 150$ mm	33398-00	1
2	Glass rod, BORO 3.3, $l = 200$ mm, $d = 6$ mm	40485-04	1
3	Test tube brush with wool tip, $d = 25$ mm, $l = 270$ mm	38762-00	1
4	Wash bottle, plastic, 250 ml	33930-00	1
5	Beaker, 250 ml, short, plastic, stackable	36082-00	1
6	Test tube, $d = 18$ mm, $l = 18$ cm, 100 pcs	37658-10	(3)
7	Test tube rack for 12 tubes; $d = 22$ mm, wood	37686-10	1
8	Tweezers, straight, blunt, $l = 130$ mm	64610-00	1
9	Protective glasses, clear glass	39316-00	1

Chemicals, Additional Material

Position No.	Material	Order No.	Quantity
1	Portable Balance, OHAUS CS200E, 200 g / 0.1 g	48910-00	1
	Sample set for study of plastics, 60 pcs. of each species	31730-00	
	Sodium chloride, 500 g	30155-50	
	Raw alcohol for burning, 1000 ml	31150-70	
	Water, distilled, 5 l	31246-81	

Material required for the experiment



Set-up

Hazards

- Pieces can split off. Wear protective glasses!
- Alcohol (methyated spirit) is highly inflammable. Extinguish all open fires.



Set-up

Number the test tubes from 1 to 4 (Fig.1).



Fig. 1

Pour 100 ml distilled water in a beaker, add 25 g sodium chloride (Fig. 2) and stir the solution till the sodium chloride has been completely dissolved (saline solution A) (Fig. 3).



Fig. 2



Fig. 3

Repeat the procedure and prepare a solution with 35 g of sodium chloride in 100 ml distilled water (saline solution B).

Set-up

Procedure

Fill two thirds of test tube 1 with alcohol (methylated spirits) (Fig. 4), repeat this procedure pouring distilled water in test tube 2 (Fig. 5), fill test tube 3 with saline solution A (Fig. 6) and test tube 4 with saline solution 4.



Fig. 4



Fig. 5



Fig. 6

Put the polyethylene rods in test tube 4, write down your result on table 1. Remove it from the test tube by means of the tweezers, rinse it with distilled water and put it in test tube 3. Again write down your result in the table, then after rinsing the rod put it in test tube 2 and then 1 (Fig. 7).



Fig. 7

Proceed in the same way with toher plastic samples. If after inmersion a plastic sample cannot be remove from the test tube, pour the content of the test tube into the collecting container, remove the plastic sample and re-fill the test tube with alcohol (methylated spirits).

Waste disposal

Rinse the plastic samples for re-use.

Evaluation

Evaluation 1

Write down your observations in general form.

Evaluation 2

Write down your results in Table 1.

Plastic sample	Behaviour in methylated spirit	Distilled water	Saline solution A	Saline solution B
PE (HD)				
PP				
PS				
PVC				
PMMA				
PC				
UP				

Questions and exercises

Task 1

Draw the conclusions from your observations.

Task 2

Write down the approximately density of the plastic samples.

Plastic sample	Density [g/cm ³]
PE (HD)	
PP	
PS	
PVC	
PMMA	
PC	
UP	