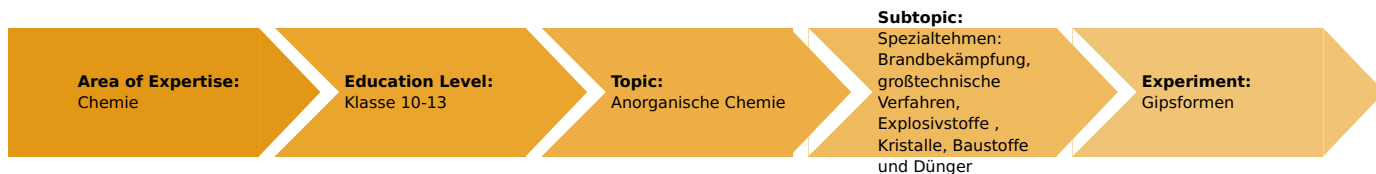


Gypsum moulds (Item No.: P7155900)

Curricular Relevance



Difficulty



Easy

Preparation Time



10 Minutes

Execution Time



10 Minutes

Recommended Group Size



2 Students

Additional Requirements:

Experiment Variations:

Keywords:

gypsum, gypsum moulds

Task and equipment

Information for teachers

Learning objectives

- Gypsum allows to produce impressions of objects.
- These "negatives" can be filled with other materials which then form the corresponding "positives" again.

Notes on set-up and preparation

Preparation

Tops of marmalade pots but also other objects are suitable for serving as objects to be filled with gypsum. Small baking cutters for cookies which fit into the tops are especially suitable for producing the moulds.

Remarks on the students' experiments

The coins and the moulds to be used must be lubricated thoroughly with paraffin since otherwise it will be too difficult to remove them from the gypsum and there might be residues sticking to them.

Make sure that the gypsum in the first part of the experiment has hardened well (for about 20 minutes).



Hazards

- Paraffin might ignite when being heated. Wear protective glasses!

Remarks on the method

Draw the students' attention to the fact that one single original mould allows to produce a large number of "copies". Explain the use of the process in the ceramic industry.

Waste disposal

- The gypsum moulds can be reused for following experiments.

- The other residual gypsum can be treated as normal waste.

Gypsum moulds (Item No.: P7155900)

Task and equipment

Task

How can gypsum moulds be produced?

Produce reusable gypsum moulds from burnt gypsum.



Equipment



Position No.	Material	Order No.	Quantity
1	Protecting glasses, clear glass	39316-00	1
2	Test tube brush w. wool tip,d25mm	38762-00	1
3	Spatula, powder, steel, l=150mm	47560-00	1
3	Circular filter,d 125 mm,100 pcs	32977-05	(1)
4	Test tube rack f. 6 tubes, wood	37685-10	1
4	Test tube, 18x188 mm, 10 pcs	37658-03	(2)
4	Test tube holder, up to d 22mm	38823-00	1
	Butane burner f.cartridge 270+470	47536-00	1
	Butane cartridge CV 300 Plus, 240 g	47538-01	1
	Paraffin, 45-50 gr 500 g	30179-50	
	Liquid paraffin, thick, 250 ml	30180-25	
Additional material			
	Building gypsum		
	Coin or something similar		
	Small baking cutter		
	Top of a marmelade pot or something similar, set of 2		
	Water		
	Yoghurt pot or something similar		

Set-up and procedure

Set-up

Hazards

- Paraffin might ignite when being heated. Wear protective glasses!



Procedure

Procedure

Fill 12 spatulas of building gypsum into a clean plastic beaker (Fig. 1), add some water and stir it by means of the glass rod in order to obtain a thick slurry (Fig. 2).



Fig. 1



Fig. 2

Lubricate a small baking cutter and a coin thoroughly with liquid paraffin. Put the coin in the centre of the top of a marmelade pot (Fig. 3) and pour some of the prepared building gypsum onto it (Fig. 4) until the top is half full (Fig. 5).



Fig. 3



Fig. 4



Fig. 5

Fill the second top half full with the prepared gypsum, too (Fig. 6). Wait until it has become semisolid and cut out a piece of gypsum of the upper gypsum layer by means of the baking cutter (Fig. 7). Allow this piece as well as the gypsum in the two tops to harden completely.



Fig. 6



Fig. 7

Remove the gypsum from the top and the coin from the gypsum mould (Fig. 8). Fill the test tube half full with solid paraffin, melt it carefully in the flame of the Bunsen burner (Fig. 9) and pour it into both moulds (Fig. 10). Allow the paraffin to solidify completely and then remove it from the moulds.



Fig. 8



Fig. 9

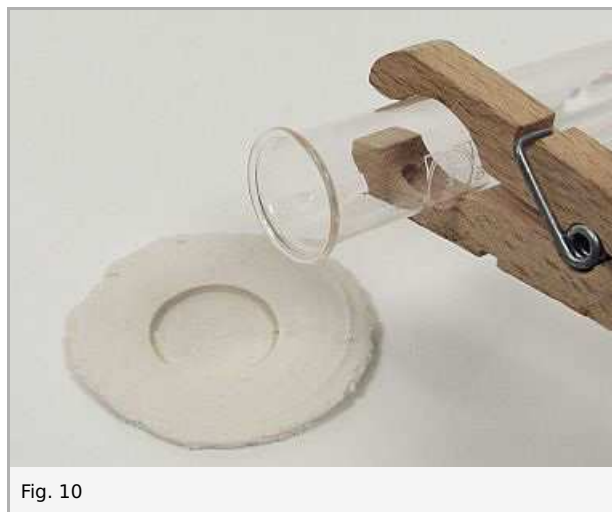


Fig. 10

Waste disposal

- Keep the gypsum moulds for following experiments.
- Treat the residual gypsum as normal waste.

Report: Gypsum moulds

Result - Observations 1

Write down your observations in a general form.

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Result - Observations 2

What can be observed when the coin impressions are produced?

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Evaluation - Question 1

In what fields of industry can the process described here be applied?

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Evaluation - Question 2

Gypsum was used in forensic laboratories in the past for what purpose?

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