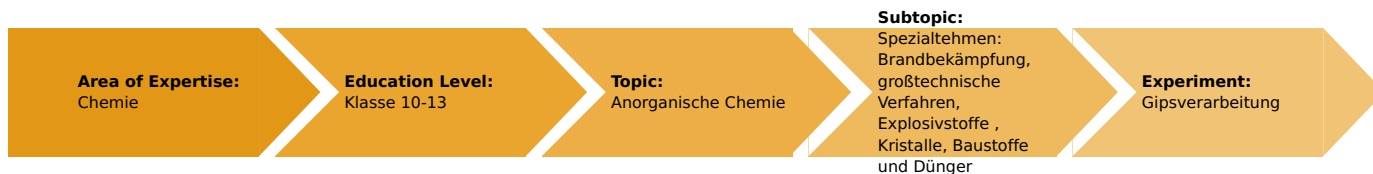


Processing of gypsum (Item No.: P7155800)

Curricular Relevance



Difficulty



Easy

Preparation Time



10 Minutes

Execution Time



10 Minutes

Recommended Group Size



2 Students

Additional Requirements:

Experiment Variations:

Keywords:

gypsum, material property

Task and equipment

Information for teachers

Learning objectives

- Burnt gypsum can be caused to harden by adding water to it. It can thus be used as a building material.
- This process is due to an absorption of water of crystallization and the subsequent re-formation of a crystalline structure.

Notes on set-up and preparation

Preparation

Use the burnt gypsum produced in the experiment "Production of gypsum plaster" for the first part of this experiment. As far as the second part of the experiment is concerned, every commercially available building gypsum can be used.

Remarks on the students' experiments

The thermometer must be covered thoroughly with paraffin or grease so that it can be taken out of the hardening gypsum. Do not use any thermometers with spherical shafts.



Hazards

- Gypsum dust must not come into contact with the eyes. Wear protective glasses!

Notes

The statement which is often made that anhydrous gypsum does not longer harden is not tenable in this apodictic form. Anhydrous stucco, for instance, which is produced at about 200 °C cannot be applied for building purposes as it hardens extremely quickly. Apart from the content of crystallization water also the burning time and temperature play an important role for the hardening of gypsum which is due to sintering effects.

Remarks on the method

This experiment together with the following one can also be applied in a polyvalent course or project like, for instance, in an arts

lesson. On this occasion, too, the time required for hardening can be discussed on the basis of the way of production and the area of application of the gypsum in question.

Waste disposal

Treat the hardened gypsum as normal waste.

Processing of gypsum (Item No.: P7155800)

Task and equipment

Task

How is gypsum processed as a building material?

Process burnt gypsum further and study its changes.



Equipment



Position No.	Material	Order No.	Quantity
1	Protecting glasses, clear glass	39316-00	1
2	Students thermometer, -10...+110°C, l = 180 mm	38005-02	1
3	Spatula, powder, steel, l=150mm	47560-00	1
4	Mortar w. pestle, 70ml, porcelain	32603-00	1
5	Glass beaker DURAN®, tall, 50 ml	36001-00	1
6	Pipette with rubber bulb	64701-00	1
7	Glass rod, boro 3.3, l=200mm, d=5mm	40485-03	1
	Liquid paraffin, thick, 250 ml	30180-25	
Additional material			
	Building plaster		
	Burnt gypsum		
	Plastic beaker, e.g. yoghurt pots, set of 2		
	Water		

Set-up and procedure

Set-up

Hazards

- Gypsum dust must not come into contact with the eyes. Wear protective glasses



Procedure

Procedure

Grind some burnt gypsum to fine powder in the mortar (Fig. 1). Fill this powder into a plastic beaker (Fig. 2) and add some drops of water by means of the pipette (Fig. 3). Stir the mixture with the aid of the glass rod in order to produce a homogeneous slurry (Fig. 4). Allow it to stand for about 30 minutes and then tear the plastic beaker open on the side (Fig. 5).



Fig. 1



Fig. 2



Fig. 3



Fig. 4



Fig. 5

In the meantime, fill some paraffin into the glass beaker (Fig. 6). Put the thermometer into the paraffin so that the shaft of the thermometer is completely covered with paraffin (Fig. 7).



Fig. 6



Fig. 7

Fill 4 spatulafuls of building plaster into the second plastic beaker, add some drops of water and stir it as described above in order to produce a thick slurry. Put the thermometer covered with paraffin into the mixture and read off the temperature every 30 seconds for about 10 minutes and note the values (Evaluation Question 2) (Fig. 8).



Fig. 8

Waste disposal

Treat the hardened gypsum as normal waste.

Report: Processing of gypsum

Result - Observations 1

Note your observations.

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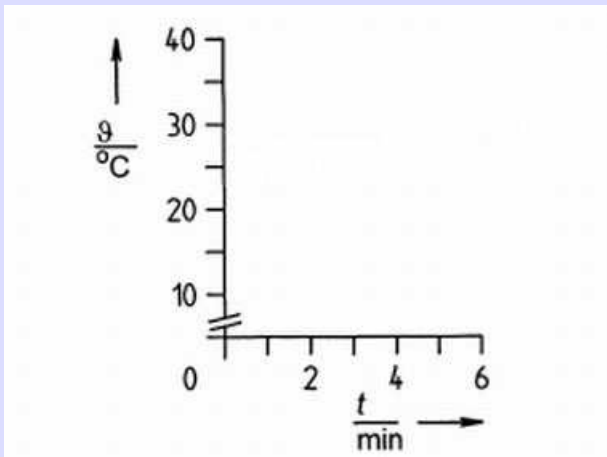
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Result - Observations 2

Draw the course of temperature into the diagram. Write down the initial temperature and the final temperature.



Evaluation - Question 1

Draw the conclusions from your observations.

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Evaluation - Question 2

Interpret the process that has taken place and describe it in the form of a reaction equation.

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Evaluation - Question 3

What could be meant by "dead-burnt" gypsum?

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