

The decomposition of organic substances



Chemistry

Organic chemistry

Basics: Organic chemistry



Difficulty level

easy



Group size

2



Preparation time

10 minutes



Execution time

10 minutes

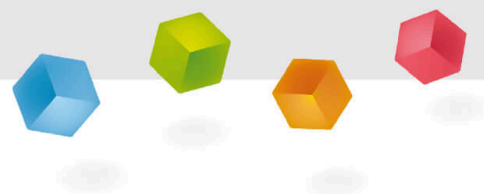
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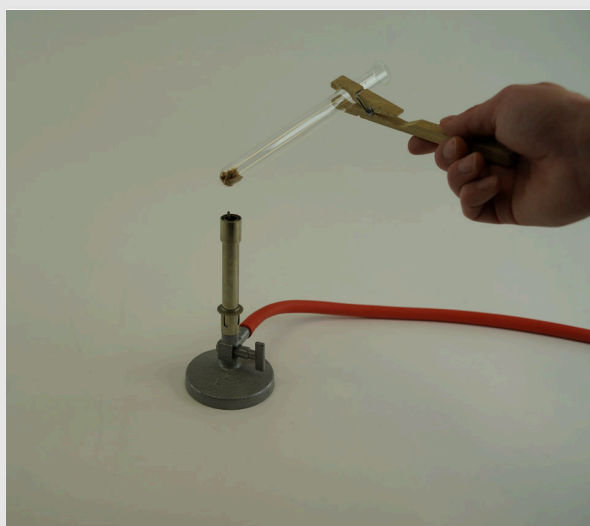
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Teacher information



Application

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Test tube over the burner

Carbon is part of every organic compound. When organic materials are burnt, carbon remains as a product in the form of ash. By heating different organic substances, the students should make a connection between organic compounds and the remaining products such as soot and ash.

Other teacher information (1/2)

PHYWE

Prior knowledge



- This experiment serves as a first introduction to the chemistry of organic substances, it also serves to demonstrate the element carbon.
- At the beginning of the lesson "Organic chemistry", point out to the students the historical "precursors" of "Organic chemistry" and the development of the terminology.

Principle



- When organic substances burn, carbon is produced in addition to carbon dioxide, which is visible to the eye.

Other teacher information (2/2)

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Learning objective



- All organic substances have carbon as a common element.
- Organic chemistry is therefore the chemistry of carbon compounds.

Tasks



- The processes involved in heating organic substances are investigated.

Safety instructions

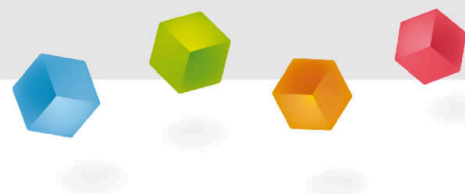
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- When heated, unpleasant smelling and harmful gases are produced. Wear protective goggles!
- If possible, carry out the test under the fume cupboard, otherwise ventilate the room well after the test!
- For H- and P-phrases please consult the safety data sheet of the respective chemical!

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Student information



Motivation

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Burnt wood becomes charcoal

Organic compounds play a decisive role in the life of living organisms. The main component of organic substances is carbon, which often remains in the form of soot, ash or coal when burnt.

Tasks

PHYWE



- Investigate the processes involved in heating organic substances.

Equipment

Position	Material	Item No.	Quantity
1	Spoon, special steel	33398-00	1
2	Test tube, 180x18 mm,100pcs	37658-10	1
3	Test tube brush w. wool tip,d20mm	38762-00	1
4	Test tube rack for 12 tubes, holes d= 22 mm, wood	37686-10	1
5	Test tube holder, up to d 22mm	38823-00	1
6	Laboratory pen, waterproof, black	38711-00	1
7	Protecting glasses, clear glass	39316-00	1
8	Copper-II sulphate,cryst. 250 g	30126-25	1
9	Sodium chloride 1000 g	30155-70	1
10	Starch,soluble 100 g	30227-10	1
11	D(+)-glucose 1000 g	30237-70	1
12	Aluminium sulphate 500 g	31022-50	1
13	Butane burner with cartridge, 220 g	32180-00	1
14	Wood splints, package of 100	39126-10	1

Set-up

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Numbered test tubes with test chemicals

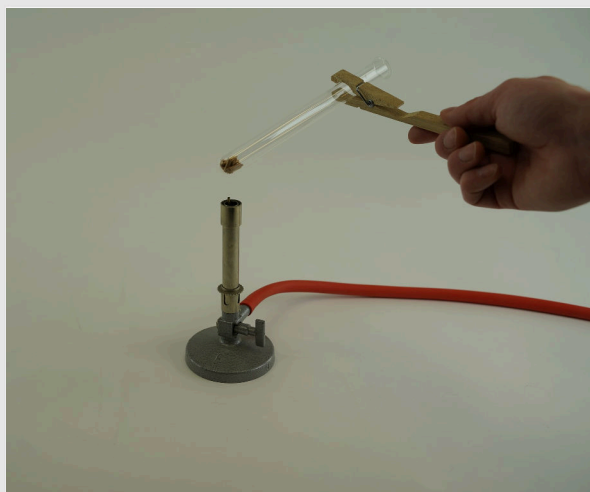
Number the test tubes from 1 to 7 and place them next to each other in the test tube rack.

Break a wood chip and put the crushed pieces of it into the test tube 1.

Add one spoonful each of the other chemicals to test tubes 2 to 7 in the order given below: glucose, starch, pieces of plastic, aluminium sulphate, copper(II) sulphate 5-hydrate, sodium chloride.

Procedure

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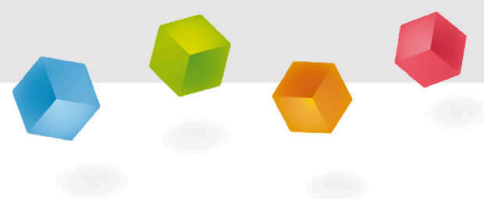


Heating the test tube over the burner

Heat the test tubes one after the other for approx. 3 min in the non-luminous burner flame.

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Report



Observation

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Write down your observations in the table below

Test tube	Contents	Observation
1	Woodchip	
2	Glucose	
3	Starch	
4	Plastic	
5	Aluminium sulphate	
6	Copper(II) sulphate 5-hydrate	
7	Sodium chloride	

Task 1

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Draw conclusions from your observations.

The substances in test tubes 1 to 4

when heated.

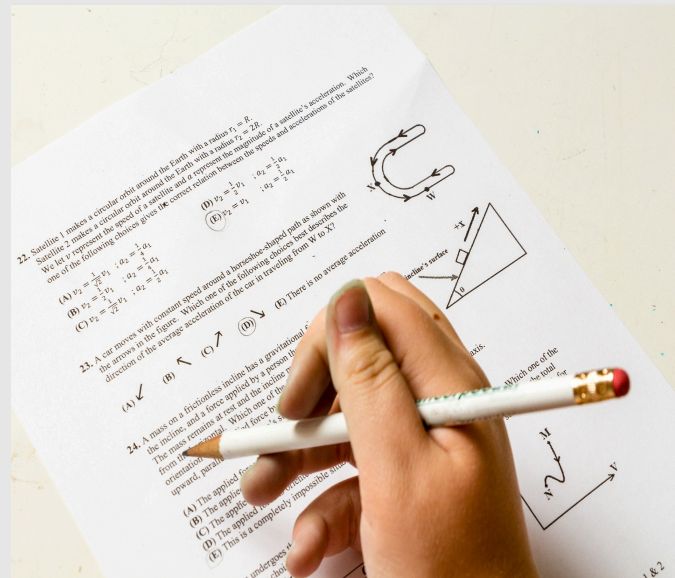
The substances in test tubes 5 to 7

when heated.

decompose

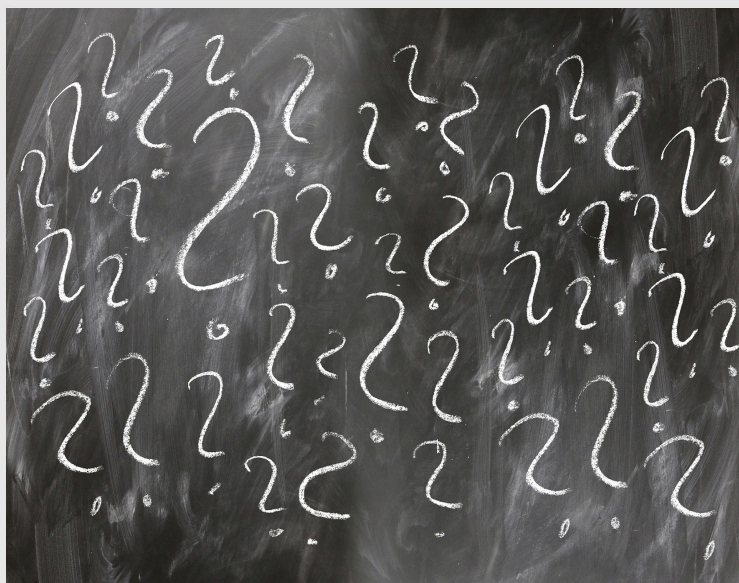
do not decompose

✓ Check



Task 2

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To which type of substance do the substances in test tubes 5 to 7 belong?

These substances are that do not decompose when heated, but at most lose crystal water. They consist of ions and only melt or decompose at very high temperatures.

✓ Check

Task 3

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Mark all organic substances.

Starch - Copper(II) sulphate pentahydrate -
plastic aluminium sulphate - wood - sodium
chloride - glucose

✓ Check

Slide

Score/Total

Slide 14: Conclusions from observations

0/2

Slide 15: Substance type Test tubes 5-7

0/1

Slide 16: Mark organic substances

0/4

Total  0/7

 Solutions

 Repeat

 Export text

10/10