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# The use of formic acid (Item No.: P7172600)



carboxylic acid , formic acid, material property

## Task and equipment

## Information for teachers

#### Learning objectives

- Formic acid inhibits the growth of bacteria and fungi.
- It is therefore used as a preservative for foods.

#### Notes on setup and procedure

<u>Preparation:</u> Provide 20% formic acid.

Remarks on the students experiments:

Label the test tube racks and put them in a warm place. After a week, the decomposition process should be so far advanced that the test can be stopped to avoid too much odor nuisance.



## Hazard and precautionary statements

Formic acid 20%:		
H226:	Flammable liquid and vapour.	
H314:	Causes severe skin burns and eye damage.	
P260:	Do not breathe dust/fume/gas/mist/vapours/spray.	
P280:	Wear protective gloves/protective clothing/eye protection/face protection.	
P301 + P330 + P331:	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.	
P305 + P351 + P338:	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.	
P309 + P310:	IF exposed or you feel unwell: Immediately call a POISON CENTER or doctor/physician.	



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## **Teacher's/Lecturer's Sheet**

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#### Hazards

- Formic acid is corrosive. Wear protective glasses!
- Wash splashes off the skin with copious water!

#### Notes

The degree of decomposition depends greatly on the storage conditions. The statements in the exemplary solutions are therefore only examples of observations which could be made.

### **Remarks on the method**

The theme "preservatives" can be discussed in general in this connection. The students could collect information on preservatives on food labels and examine their chemical content.

### Waste disposal

• Put the contents of the test tubes into the biodegradable waste.



advanced

# The use of formic acid (Item No.: P7172600)

## Task and equipment

#### Task

## What is the industrial use of formic acid?

Examine the effect of formic acid on fermentation or putrefaction processes.



advanced

## Equipment



Position No.	Material	Order No.	Quantity
1	Test tube rack for 12 tubes, holes d= 22 mm, wood 37686-10 1		1
2	Test tube brush w. wool tip,d25mm 38762-00 1		
3	Pipette with rubber bulb 64701-00 1		1
4	Labor pencil, waterproof 38711-00 1		1
5	Test tube, 180x18 mm,100pcs 37658-10 (6)		(6)
6	Scissors, l = 110 mm, straight, point blunt 64616-00 1		1
7	Protecting glasses, clear glass	39316-00	1
	Formic acid 98-100% 250 ml	30021-25	1
	Cotton wool, white 200 g	31944-10	1
Additional material			
	Fruit juice		
	Hard cheese		
	Parts of plants (grass)		



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# Set-up and procedure

## Set-up

## Hazards

- Formic acid is corrosive. Wear protective glasses!
- Wash splashes off the skin with copious water!





## Procedure

Number the test tubes from 1 to 6. Using the scissors, cut the plant material into small pieces (Fig. 1). Crumble the cheese down to small pieces which fit into the test tube.



Fill test tubes 1 and 2 one third full with fruit juice. Put the plant pieces in test tubes 3 and 4, and the crumbled cheese in test tubes 5 and 6, all to a height of about 3 cm.

Add about 10 drops of formic acid to the test tubes 2, 4 and 6 (Fig. 2). Close the test tubes with a cotton wool plug (Fig. 3) and store them somewhere warm for a week or so.



## Waste disposal

Put the contents of the test tubes into the biodegradable waste.



# **Report: The use of formic acid**

#### **Result - Observations**

Note the observations you make in general.

#### Result - Table 1

Enter your results in table below.

Test tube	Content	Result
1	Fruit juice	unpleasant smell, froth formation 1
2	Fruit juice + formic acid	very little changes 1
3	Pieces of plants	rotten smell, mould growth
4	Pieces of plants + formic acid	grey colouration, little change
5	Cheese	unpleasant smell, mold growth 1
6	Cheese + formic acid	slight discolouration, little change 1



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#### **Student's Sheet**

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#### **Evaluation - Question 1**

Draw conclusions from your observations, thereby answer the question in the header.

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#### **Evaluation - Question 2**

How can the effect of the formic acid be explained?



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