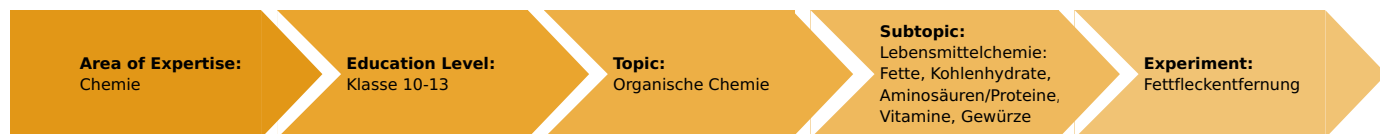


Removal of grease stains (Item No.: P7186000)

Curricular Relevance



Difficulty



Intermediate

Preparation Time



10 Minutes

Execution Time



20 Minutes

Recommended Group Size



2 Students

Additional Requirements:

Experiment Variations:

Keywords:

fats, solubility, removal of grease stains

Task and equipment

Information for teachers

Additional Information

The students are acquainted with the problem of clothing spoilt by a grease stain. Stain remover is present in most households. The question is, how effective are they, or which hazards are inherent to them?

Notes on content and learning objectives

- Grease stains can be dissolved out by treating them with petroleum ether.
- With coloured textiles, the colour-fastness of the material must be tested on an inconspicuous part prior to stain removal.
- Halogenated hydrocarbons are favoured because of their solubility for fats, but their use is ecologically of concern as well as being a health hazard.
- Organic solvents are highly inflammable.

Notes on the method

We recommend that the students bring variously coloured cloth remnants with them and test their colour-fastness. The ingredients of commercially available stain removers should be determined. A list of ingredients is very informative. The dangers associated with the use of stain removers containing solvents at home should be discussed in the period (combustibility, poisonous liquid, vapours).

Fundamentals and remarks

Petroleum ether is often used for stain removal.

The use of other organic solvents with better stain-dissolving properties should be refrained from, because of the following reasons:

- Toxicology, e.g. aromatic hydrocarbons such as benzene and toluene
- Danger of explosion, e.g. diethyl ether
- Ecology, e.g. halogenated hydrocarbons such as trichloroethylene and perchloroethylene.

Hints on going deeper

- The students should critically examine the stain removers used in their own home on the basis of the new information.

- A list of alternative, non-hazardous stain removers can be made, alternatives such as gall soap or tensides should be considered

Notes on the set-up and procedure

Preparation:

A grease stain can be removed from a piece of cotton material in the same way, when a linen cloth is not available.

Notes on the students experiment:

The experiment should be performed in a fume cupboard whenever possible, as petroleum ether is very volatile. For the same reason, the experiment should be carried out quite rapidly.



Hazard and Precautionary statements

Petroleum ether:

H225:	Highly flammable liquid and vapour.
H304:	May be fatal if swallowed and enters airways.
H315:	Causes skin irritation.
H361f:	Suspected of damaging fertility or the unborn child.
H336:	May cause drowsiness or dizziness.
H373:	May cause damage to organs through prolonged or repeated exposure.
H411:	Toxic to aquatic life with long lasting effects.
P210:	Keep away from heat/sparks/open flames/hot surfaces – No smoking.
P233:	Keep container tightly closed.
P240:	Ground/bond container and receiving equipment.
P273:	Avoid release to the environment.
P281:	Use personal protective equipment as required.
P301 + P310:	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P302 + P352:	IF ON SKIN: Wash with soap and water.
P304 + P340:	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P308 + P313:	IF exposed or concerned: Get medical advice/attention.
P331:	Do NOT induce vomiting.
P403 + P235:	Store in a well ventilated place. Keep cool.

Hazards

- Petroleum ether is highly inflammable. Extinguish all open flames before handling petroleum ether!
- Do not allow the liquid to contact skin, eyes or clothing.
- Work in a fume cupboard if possible.

Waste disposal

Leave the crumbs and the filter paper in the fume cupboard.

The remains can be put in the normal waste container after all petroleum ether has evaporated off.

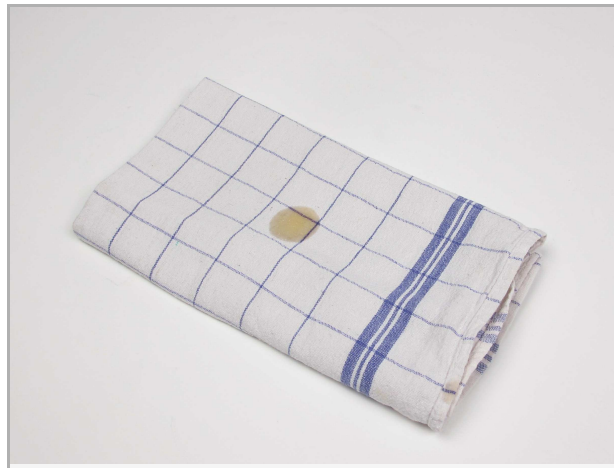
Removal of grease stains (Item No.: P7186000)

Task and equipment

Task

How can grease stains be removed?

Try to remove a grease stain from a linen cloth.



Equipment



Position No.	Material	Order No.	Quantity
1	Glass beaker DURAN®, short, 400 ml	36014-00	1
2	Pipette with rubber bulb	64701-00	2
3	Spoon, special steel	33398-00	1
4	Glass rod, boro 3.3, l=200mm, d=6mm	40485-04	1
5	Protecting glasses, clear glass	39316-00	1
6	Rubber gloves, size S (7)	39325-00	1
	Petroleum ether, 40-60 gr 1000 ml	30184-70	1
	Magnesium oxide 100 g	31546-10	1
	Circular filter, d 125 mm, 100 pcs	32977-05	1
Additional material			
	Weight for weighing down		
	Linen cloth		

Set-up and procedure

Set-up

Hazards

- Petroleum ether is highly inflammable. Extinguish all open flames before handling petroleum ether!
- Do not allow the liquid to contact skin, eyes or clothing.
- Work in a fume cupboard if possible.



Setup

Pipette two drops of vegetable oil onto the linen cloth (Fig. 1) and put the cloth aside for a few minutes.

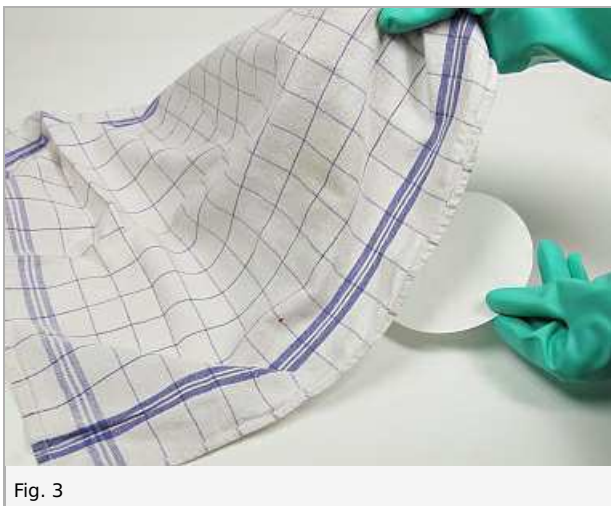


Procedure

Fill the 400 ml glass beaker up to a height of 1 cm with magnesium oxide. Stir the magnesium oxide with as much petroleum ether as is necessary to give a crumbly mixture (Fig. 2).



Place a filter paper under the linen cloth, so that it is beneath the grease stain (Fig. 3). Distribute the moist, crumbly mixture over the grease stain with a spatula (Fig. 4).



Place an other filter paper on top of the crumbly mixture and position a weight on top of the filter paper (Fig. 5). Wait approx. 5 minutes, then remove the weight, the filter paper and the crumbs. Inspect the linen cloth.

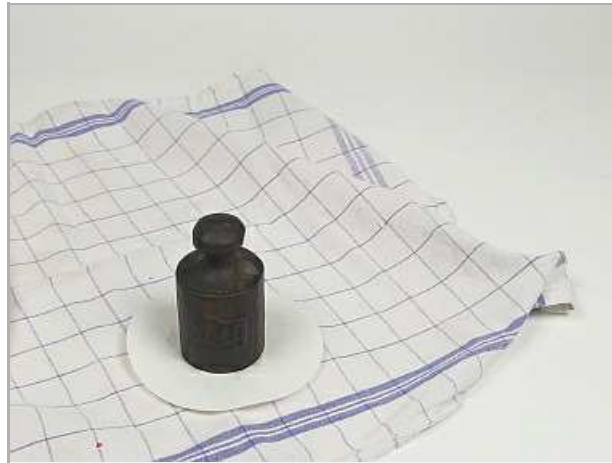


Fig. 5

Should the grease stain still be visible, repeat the cleaning process.

Waste disposal

Leave the crumbs and the filter paper in the fume cupboard.

The remains can be put in the normal waste container after all petroleum ether has evaporated off.

Report: Removal of grease stains

Result - Observations

Describe what you have observed.

.....

.....

.....

.....

Evaluation - Question 1

Draw conclusions from your observations.

.....

.....

.....

.....

Evaluation - Question 2

With which other means can grease stains be removed?

.....

.....

.....

.....

Evaluation - Question 3

What must be taken into consideration when cleaning fat off of coloured textiles?

.....

.....

.....

.....

Evaluation - Question 4

Complete the following statements:

1. Petroleum ether is a good for fats.
2. Because of its, magnesium oxide can take up a mixture of fat in petroleum ether.
3. Not all solvents are suitable for removing grease stains.
4. hydrocarbons are, petroleum ether and acetone are highly