

# Microplastics in Table Salts?

## How to easily study them

### INSTRUCTION MANUAL FOR HOME CHEMICAL LABORATORY

#### What is it for?

The aim of this instruction manual is to illustrate the procedure to separate, observe and quantify microplastics and other insoluble particles present in table salts at home, or in an educational center that does not have a chemical laboratory. In addition, these activities are based on four of the Sustainable Development Goals (SDGs): 3, 4, 6 and 12.

#### Who is it for?

This manual is aimed at primary school students aged 10-11, at those educational centers that do not have a chemical laboratory, or at any interested person who wants to carry out the experiment with simple materials available at home.

#### Why to use this manual?

We will use this manual as complementary material to the educational guide and the workbook for the student. In addition, with the help of the instructions we will be able to complete the observations and activities proposed in the educational guide.

#### How to use the manual?

The manual is structured in 5 parts, where it is illustrated how we should prepare the laboratory, the material that we will need, the procedure, the observations and results, and finally, other laboratory options. To facilitate the development of the activity, additional material can be consulted at:

 <http://www.ub.edu/sedimentary-geology/microplastics-salt>

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# LABORATORY PREPARATION

## How to avoid sample contamination?



YES

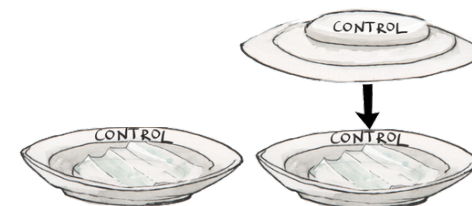


### REMEMBER!

Expose the control filter during the experiment and cap after completion. If the salt filter is exposed, it will control environmental microplastic contamination during sample treatment.

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- Use a filter to control airborne contamination during laboratory work.
- Uncap and cover the control filter when running salt samples.
- Airborne microplastics will be retained and we will be able to quantify them.



2

- Clean work surfaces and material (inside and outside) with filtered or bottled water.
- Mop the laboratory floor with water.

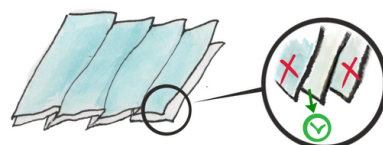
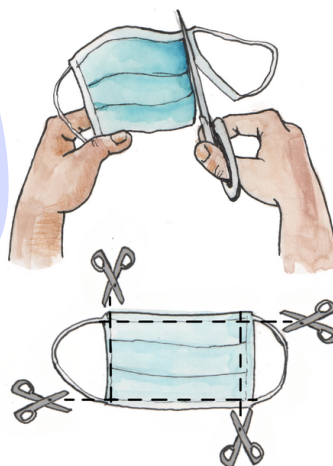
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- Hair tied back or with a cotton cap.
- Wear brightly colored cotton clothing.
- Wash hands with soap and water.
- Do not use hand cream or makeup.
- Do not wear plastic gloves.

4

Prepare filters and contamination controls:

- Cut and separate the central filter of a mask.



YES



3

- Use glass, metal or ceramic containers.
- Avoid the use of plastic.

Avoid



NO



YES



# HOME LABORATORY MATERIAL



- A. Balance
- B. Aluminium foil
- C. Plasticine tablet
- D. Adhesive tape
- E. Domestic vacuum cleaner
- F. Spoon
- G. Plastic hose
- H. Surgical mask
- I. Bottle to collect water
- J. Scissors
- K. Water (bottled, tap,...)
- L. Table salt
- M. Italian coffee funnel
- N. Crystal glass
- O. Glass, metal or ceramic bowl
- P. Glass, metal or ceramic plate
- Q. Notebook and pencil
- R. Glass jar with lid
- S. Magnifying glass

## GENERAL CONSIDERATIONS:

- Note the color of the clothes worn during the experiment.
- Write down the type of water used and filter it beforehand.
- Note the type of filter used.
- Clothes can be rubbed with a filter to see how fibers come off.



## PREPARATION OF MATERIALS:

- With the help of the vacuum cleaner, the flexible tube, the adhesive tape, the plasticine and the bottle, prepare the **homemade vacuum pump**.
- Put a surgical mask filter in the funnel of the Italian coffee maker.
- Pierce the bottle and tape the flexible tube so that it is well fixed.



- Choose any water and **filter 1-2L x2 times** using the home vacuum pump.

## HOME PROCEDURE

- 1 Place the exposed control filter near the salt. Weigh 50 g of salt and record the weight. Cover the salt and control filter.



- 2 Introduce the salt sample into the glass jar.



- 3 Dissolve the salt in 500 mL of filtered water. Stir with a spoon until the salt is well dissolved.



- 4 Cover the glass jar containing the solution and the control filter. If the salt does not dissolve, leave the solution for a few hours or even a day, until it dissolves completely.



- 5 Put a surgical mask filter in the funnel and pour the solution with the dissolved salt.



- 6 Cover the funnel and the control filter. Turn on the vacuum cleaner and filter the salt solution with the domestic vacuum pump.



- 7 Pick up the filter and cover it. Cover the control filter.



### REMEMBER!

Always cover and uncover the control filter and the experimental sample at the same time. This way you will know if the sample is being contaminated.

1

### WHAT SHOULD YOU DO?

- Observe the filters with a binocular loupe.



## OBSERVATIONS AND RESULTS

2

### WHAT CAN YOU SEE?

- Microplastics (fibers normally).
- mineral particles.
- Remains of insects or other organisms.



4

### HOW TO QUANTIFY MICROPLASTICS?

- Contar los microplásticos de cada filtro.
- Restar los microplásticos contados en los filtros de control (contaminación ambiental).

3

### HOW TO DESCRIBE MICROPLASTICS?

- Shape (fibers normally)
- Size
- Color
- Quantity

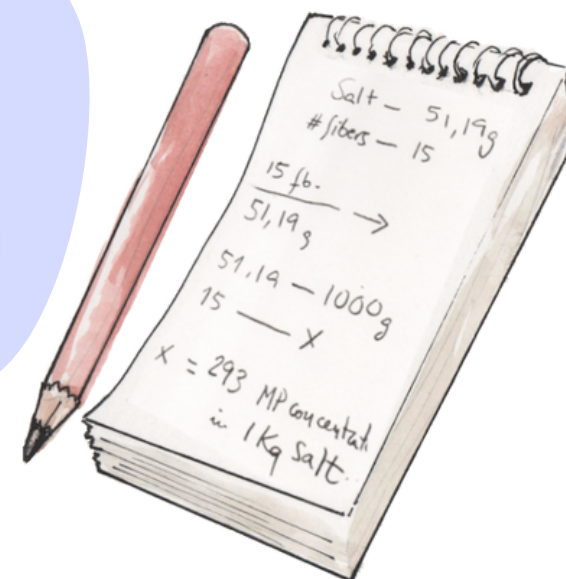
You can use one token for each sample.

You can use a ruler to compare sizes.

5

### HOW TO CALCULATE THE CONCENTRATION IN MICROPLASTICS?

- Count the microplastics on each filter.
- Subtract the microplastics counted in the control filters (environmental contamination).



Sample:

Type of sample:

	Dark	Light	TOTAL
Green (E)			
Blue (B)			
Magenta (M)			
Red (R)			
Cyan (C)			
Yellow (Y)			

BLACK		
WHITE/ TRANSPARENT		
UNKNOWN		

OBSERVATIONS:

## OTHER LABORATORY OPTIONS

If some filtration materials are not available, let's look at other lab procedures that use gravity filtration!



A. Balance  
B. Surgical mask (optional)  
C. Aluminium foil  
D. Funnel (non-plastic)  
E. Scissors

F. Spoon  
G. Filter paper  
H. Cup (non-plastic)  
I. Water  
J. Table salt

K. Magnifying glass  
L. Bowl (non-plastic)  
M. Plate (non-plastic)  
N. Notebook and pencil  
O. Container (non-plastic)



### ATTENTION!

Some particles will not be retained as the pores in the filter are larger than the particles themselves.