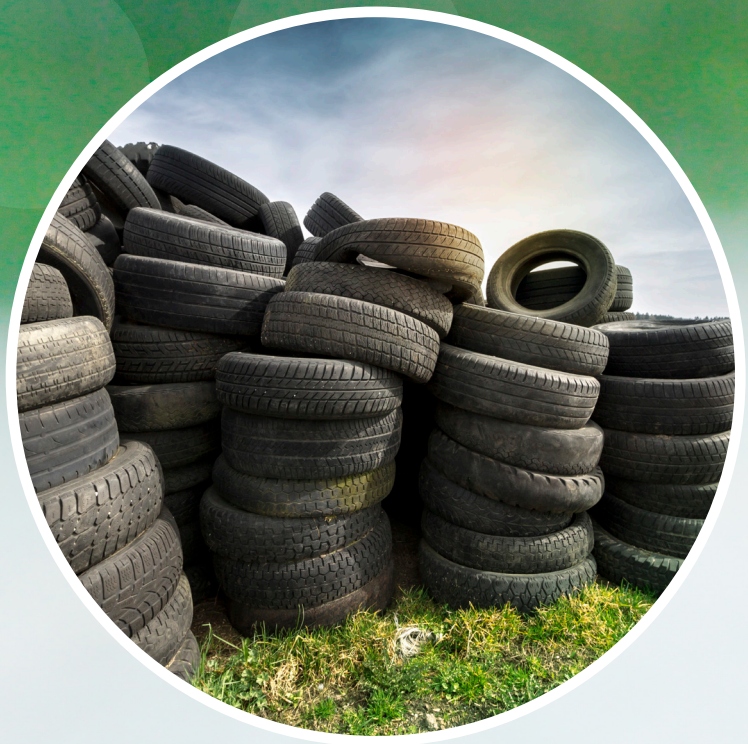


# New and improved analysis of **MICROPLASTIC AND RUBBER PARTICLES** **IN WATER** QUANTITATIVE METHOD



# MICROPLASTIC AND RUBBER ANALYSIS OF CLEAN WATER

The presence and effects of microplastics (MP) have drawn more and more attention among current environmental issues. The size fraction considered varies, but microplastics refer in the literature frequently to 0.1–5000  $\mu\text{m}$  (eg EFSA, 2016).

It is difficult to give an exact figure of the amount of microplastics that is released into nature. The sources are numerous and the uncertainties are large but among the biggest sources, road traffic has been pointed out together with artificial turfs, boats, building facades, plastic production and waste water treatment plants. Occurrence in environmental matrices such as wastewater, landfill leachates and surface water varies and depends on several factors.

**QUANTITATIVE METHOD FOR  
8 POLYMERS!  
WITH PYROLYTIC GCMS**



**RUBBER INDICATORS**



**POLYISOPRENE  
POLYBUTADIENE**

## MINIMUM SAMPLE AMOUNT



2x1 Liters in glass containers (Water samples)  
2x1 Liters in sealed original sample container (Drinking bottled water)  
+ one empty container as control (all sample types)

The filling and rinsing of bottles three times in the sampling process is recommended. The sampler should carefully take into account the presence of polymer contamination risk. Please wear all natural fiber clothing when taking samples (e.g. 100% cotton). Do not wear synthetic fleece. It can also be advantageous to perform the sampling against the wind direction.

Put screw top/lids back on as soon as possible after sampling.

There is no need of conservation or cooling of sample prior to shipment to lab in Bergen.

The samples are treated in polymer-particle free lab facilities. We carry out blanks throughout the analysis process.

# POLYMER PARTICLES WITH SIZE <5MM IN CLEAN WATER

## DRINKING WATER

### MICROPLASTICS

ORDER CODE: MX130

Filtration on a 0,2 µm filter.

#### REPORTING (MASS CONCENTRATION)

- µg/L of individual polymer type (PE, PP, PS, PVC, PET, PC, PMMA, PA6) and as a sum MP
- µg/L of polyisoprene and polybutadiene
- Comment regarding qualitative identification of rubber

## CLEAN WATER

### MICROPLASTICS

ORDER CODE: MX131

Filtration on a 27 µm filter.

### RUBBER

ORDER CODE: MX136

Filtration on a 27 µm filter.

### COMBINATION PACKAGE

#### MICROPLASTICS & RUBBER

ORDER CODE: PMX70

Filtration on a 27 µm filter.

### MICRO PLASTICS IN SALT

Determination of MP in a salt sample can be performed by dissolving 50 g salt into particle free water in the lab followed by the two methods described for water.

#### ORDER CODES:

MX530 (>27 µm)

MX531 (>0,2 µm)

MX536 Rubber in salt (>27µm)

## ANALYTICAL METHODS

Micro plastic particles can be easily filtered from clean liquid samples with a vacuum filter. Filter papers will be assessed for the presence of suspected plastics with different methods. The presence of high volumes of particulate matter can make processing and identification more complicated.

For regulatory purposes the mass determination by Py-GCMS is most relevant and expected to become the most relevant analytical technology. The Py-GCMS is a

very specific method to determine particles of individual polymer types of all sizes.

Rubber tires are made of a combination of natural and synthetic rubber in addition to other compounds added to improve mechanical and chemical properties. The physiochemical properties of rubber make the rubber particles difficult to analyze using nondestructive methods as FTIR and x-ray spectroscopy.

Py-GCMS offer the possibility of analyzing the chemical composition of rubber particles despite these difficulties.

Common tire rubber constituents such as polyisoprene from natural rubber (NR) and polybutadiene from butadiene rubber (BR) and styrenebutadiene rubber (SBR) can be used to indicate the presence of rubber particles in a filtrated sample.

#### References:

Marten Fischer and Barbara m. Scholz-Böttcher, ICBM, Carl von Ossietzky University of Oldenburg, Environ. Sci. Technol. 2017, 51,5052-5060.

Tomasz Lachowicz, Janina Zieba-Palus, and Pawel Koscielniak, Jafellonian University, Faculty of Chemistry, Krakow, Poland, Analytical Letters, 46:2332-2344, 2013.

## QUESTIONS AND SHIPMENT

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