

I CONVEGNO ISTITUTO DI SCIENZE POLARI

Py-GC/MS as a complementary technique for the chemical characterization of small microplastics (<100 μm) in polar samples

Gregoris E., Corami F., Rosso B., Gambaro A., Barbante C.



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Microplastics analysis

Visual methods

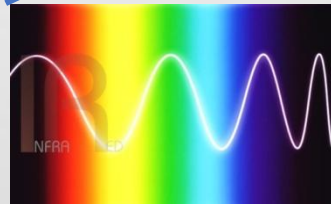
Optical microscopy



Scanning electron
microscopy (SEM)

Light scattering particle counter

Spectroscopic methods



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μ -FTIR

μ -Raman

Thermal analysis

Py-GC/MS

TED-GC/MS



MPs



μ -FTIR vs. Py-GC/MS

BEST FOR
PARTICLE
NUMBER
NON-
DESTRUCTIVE

μ -FTIR	Py-GC/MS
Visual identification \rightarrow particle number, size distribution, shape	No visual identification
Identification of polymers by FTIR	Identification of polymers by MS
Quantification of mass concentration estimated by density	Direct quantification of mass concentration
Non destructive	Destructive
Time-consuming	Not time-consuming

BEST FOR
IDENTIFICATION
QUANTIFICATION
FAST

Our plan

Library of plastic materials

- PE, PS, Kraton[®], to be implemented

Test Py-GC/MS

- Confirm PE in μ -FTIR samples

Instrumental method

- Optimisation of instrumental parameters

Pre-analytic procedure

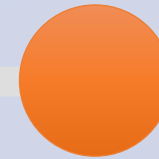
- Common procedure for μ -FTIR and Py-GC/MS

Quantification

- Development of a quantification method for plastics

Additives

- Development of a method for identification of plastic additives



WE ARE HERE



Our contribution

Occurrence of emerging contaminants (plastics and additives) in the Polar Regions

Contaminants trasport to the Poles

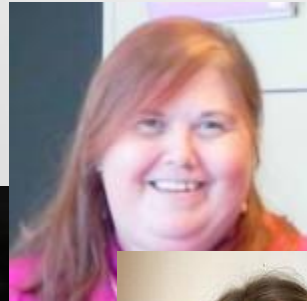
ecosystem response to contaminants exposure

interaction between various environmental domains



Thanks

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*Microplastics
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