EXTRACTION AND DETERMINATION OF PERSONAL CARE PRODUCTS ADSORBED ON MICROPLASTICS

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INTRODUCTION

- **Plastics** in the ocean and marine organisms have attracted media attention as a real evidence of **human impacts** on environment.
- From the huge variety of plastics which arrive to water body, **microplastics** (MPs, plastics with a size lower than 5 mm) are the most concerning ones.
- **MPs** are found, not only in waters but also in sediments or aquatic organisms of all water bodies of the globe [1].
- **MPs** are toxic for aquatic organisms, however the possibility that other pollutants as **organic molecules** could be **adsorbed** on microplastics have been not studied enough.
- We propose a study to know if the surface of MPs could acts as a **pollution vector** of **Personal Care Products** (PCPs) in marine ecosystem.
- Among PCPs, **UV filters** are added in sunscreens and cosmetics and they could be harmful for biota [2].

UV Filters

Emerging contaminants used in **Personal Care Products** to absorb UV light

Described **as bioaccumulative, pseudo-persistent** and **mutagenic**

Great interest to know their **presence** and **distribution** in the environment

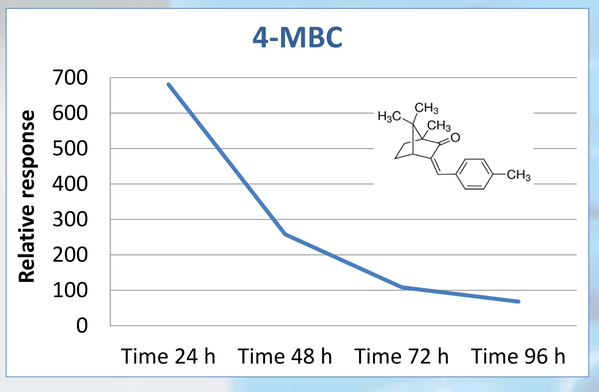
EXPERIMENTAL

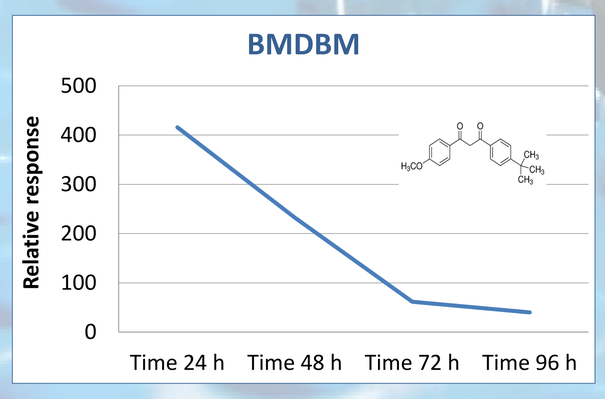
Chemical name	Abbreviation	Nº CAS
2-Hidroxi-4-metoxibenzofenona/oxibenzona	BP-3	131-57-7
Isopentil-4-metoxicinamato/amiloxato	IMC	207574-74-1
1-[4-(1,1-Dimetietil)fenil]-3-(4-metoxyfenil)propan-1,3-diona/avobenzona	BMDBM	70356-09-1
3-(4'-Metilbencilideno)-D,L-1 alcanfor/enzacameno	4-MBC	36861-47-9

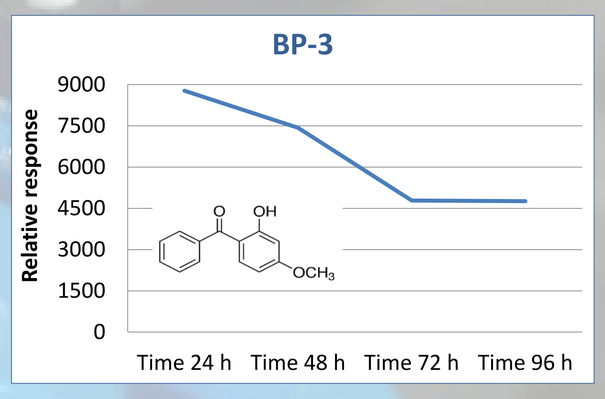
SHAKING	
SPEED	30 rpm
TEMPERATURE	room
SOLVENT	MilliQ water

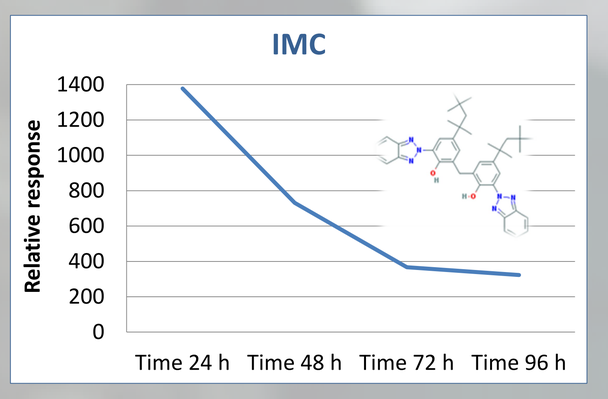
UHPLC-MS/MS DETERMINATION	
COLUMN	Oasis HLB (2.1 x 30 mm, 20 µm)
pH	2.5
MOBILE PHASE	MeOH 0.1 % ac. Formic (0.4 mL/min)

RESULTS









The absorption experiments carried out by putting pellets of MPs in an aqueous solution containing target UV filters revealed a decrease in their concentrations after 24, 48, 72 and 96 h.

CONCLUSIONS

- The decreasing of the UV filters concentrations in the aqueous solution could indicate their absorption on MPs.
- The level of removing from solution depends on the characteristics of the compound.
- Subsequent studies are required to found a optimum methodology to extract the pollutants from MPs and to know their real impact in marine ecosystems.

REFERENCES

[1] Cole, M., Lindeque, P., Halsband, C., & Galloway, T. S. (2011). Marine pollution bulletin, 62, 2588.
[2] Sánchez-Quiles, D., A. Tovar-Sánchez, A. (2015). Environmental International, 83, 158.

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