

ANDROMEDA Artificial Microplastic Degradation Methods

Methodology	Strengths / Weaknesses	Status at Project Start / Gaps
UV	Most natural to simulate in the laboratory at conditions considered to be environmentally relevant. Faster than natural exposure, but still not super quick.	Necessary equipment widely available across different laboratories in the consortium (e.g. Atlas Suntest CPS+). SOP for weathering under dry and wet conditions available.
Hydrolytic	Very fast, but has to be operated at conditions not found in the environment (pH 14, 90 degree C). Hydrolysis is not a major degradation pathway in the environment. The approach is only viable for certain polymer types (e.g. polyester) that are susceptible to cleavage. Does provide a surface morphology similar to that produced by UV degradation.	Hydrolysis was successfully applied to fibers (SINTEF). Its potential use for other MP types remains however uncertain. Published method: 10.1021/acs.estlett.0c01002
Thermo-oxidative	Exothermic oxidation is not a relevant pathway in the environment, but slow thermal oxidation in combination with photodegradation is possible.	Method development and validation needed.
Microbial oxidation	Extremely slow for most polymer types under all environmental conditions.	Method development and validation needed.

ANDROMEDA is funded by JPI Oceans through support by the following national funding agencies: Belgium: the Belgian Federal Science Policy Office (**BELSP**O), France: The National Research Agency (**ANR**), Estonia: Ministry of the Environment of the Estonian Republic (**MoE**) and the Estonian Research Council (**ETag**); Germany: Federal Ministry of Education and Research (**BMBF**), Ireland: Marine Institute, and the Dept of Housing, Planning, and Local Government (**DHPLG**); Malta: Malta Council for Science and Technology (**MCST**); Norway: The Research Council of Norway (**RCN**); Spain: Spanish State Research Agency (**AEI**); Sweden: the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (**FORMAS**).