

RECYCLING & WASTE MANAGEMENT

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Understanding the fragmentation of plastic debris in the environment

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Over 322 million tons of plastic have been produced worldwide in 2015. Plastic inputs into the ocean was estimated at 8 million metric tons in 2010. Most concerning is the estimation for 2025 that could reach 150 million metric tons if the effort to develop collection, sorting and reprocessing of recyclable plastics is not prosecuted. Plastic debris is abundant and widespread in the environment. Marine plastic pollution has been recently recognized as a global environmental threat 2, 3. The scientific community has been able to record the breadth of this pollution worldwide but the adverse consequences on ecosystems and human health is not fully understood. There are still fundamental knowledge gaps in the transformation and fate of plastic debris in the aquatic or marine environment. Understanding the fragmentation of plastic debris is an essential step in order to apprehend in which way very small plastic particles are formed (micrometric and nanometric). The results presented are based on a detailed physicochemical characterization of microplastics (300 μm – 5 mm) collected at the surface of the North Atlantic accumulation zone. The result implies that smaller fragments are formed and underline the need to develop reliable sampling and detection methods for very small plastic particles in environmental samples. The

French project Expedition 7th Continent will be also presented. It gather scientific studies together with political and societal actions. Controlling plastic pollution involves promoting recycling and the circular economy. These measures must be accompanied simultaneously by a change in our consumption behavior, through education and citizen awareness, because the health of the sea and the oceans depends on each of us. The accumulation of waste in the sea is a global problem that requires comprehensive and coordinated solutions.

Speaker Biography

Alexandra ter Halle is a full time researcher since 2004. First she was part of the Laboratoire de Photochimie Moléculaire et Macromoléculaire (LPMM, UMR 6505 CNRS-Université Blaise Pascal, Aubière) and since September 2011 she joined the laboratoire des IMRCP (Université Paul Sabatier, Toulouse). After studying at the Ecole Normale Supérieure de Lyon from 1993 to 1997 she graduated her PhD in organic chemistry in 2000 et the Université Claude Bernard de Lyon. During 7 years in Clermont Ferrand her researches were focused on the fate of organic contaminants under irradiation. She has initiated and coordinated different projects (project ANR ECOPHYTO, FUI PHYTOMAR, and industrial partnership with Syngenta). At the IMRCP she is studying green materials for use in environmental chemistry. She is the author of about 46 publications and 6 patents.

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