Chemicals in Plastic – Main Findings of the Technical Report for UNEP

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Chemicals in Plastics: A Technical Report
- Main objectives

- Provide scientific evidence, based on extensive literature review on the chemicals-related issues of the plastic pollution crisis.
- Close some of the knowledge gaps related to chemicals in plastics, with a particular focus on additives, their environmental fate and related human and environmental impacts.
- Identify levers, in order to protect human health and the environment and support a “toxic-free” circular economy.
Chemicals in Plastics: A Technical Report - Main content

Describes the various chemicals-related issues of plastic pollution:
1) Chemicals of concern and impacted sectors that use plastics
2) Environmental fate and health effects of plastic-associated chemicals
3) Problems with the current state of chemical risk assessments
4) Options for addressing chemicals of concern in plastics
5) Strategies for substituting problematic chemicals
6) Managing existing plastic waste and plastics in a circular economy.

- Developed by UNEP in cooperation with the BRS Secretariat with lead authors from the International Panel on Chemical Pollution.

- The report is available with a summary and key findings:
  - INF doc INC2: [https://www.unep.org/events/conference/second-session-intergovernmental-negotiating-committee-develop-international/documents#OtherDocuments](https://www.unep.org/events/conference/second-session-intergovernmental-negotiating-committee-develop-international/documents#OtherDocuments)
Chemicals in Plastics: A Technical Report

- Methodology

• Extensive literature review: The authors of the report published two peer reviewed studies on chemicals in plastics and the databases of both reviews were combined for the Technical Report.

• Supported by consultative process and input from additional experts/reviewers.


ANATOMY OF PLASTICS
WHAT’S IN MY PLASTICS?

1. MONOMERS AND POLYMERS
   constitute main building blocks of plastic material

2. ADDITIVES
   bring desired functionality to the plastic material

3. OTHER INTENTIONALLY ADDED SUBSTANCES
   such as starting materials and catalysts

4. NON-INTENTIONALLY ADDED SUBSTANCES
   such as solvents, cleaning agents, or impurities from manufacturing or recycling

BREAKDOWN
most widely produced plastic additives*
*Source: Geyer et al. 2017

- **Plasticizers** to make plastic softer and flexible e.g. phthalates, chlorinated paraffins
- **Fillers** that occupy space without changing functional properties e.g. mica, talc or clay
- **Flame retardants** to reduce flammability and prevent spread of fire - e.g. brominated and chlorinated flame retardants
- **Other** including colorants, antioxidants, heat and light stabilizers, lubricants, biocides or antistatic agents
1. **Chemicals are an integral part of plastics.** Over 13,000 substances have been associated with plastics. >3200 are chemicals of potential concern.

2. **Ten groups of chemicals are identified as being of concern** due to their hazardous properties.
3. Chemicals of concern have been found in plastics across a wide range of sectors and products value chains.
4. Chemicals of concern in plastics can impact our health and our environment.

5. Women and children are particularly susceptible to these hazardous chemicals. Men are not spared either.
6. Chemicals of concern can be released from plastic along its entire life cycle.

Chemical additives are typically not bound to the polymer and therefore can be released from plastics over time, leading to ecosystem and human exposures.
While for high income countries exposure has been documented for the use phase, for LMI-countries additionally the end-of-life phase with dumping and open burning result in environmental releases and human exposure.
Thank you for your attention

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