

Why Low POPs Content Level Matters

A summary of the latest studies

Side event “Why Low POPs Content Level Matters “

Geneva – 1 May 2023

RNDr. Jindřich Petrlík

Arnika Association / IPEN expert on dioxin and POPs waste

Incinerator fly ash – losing control with many uses (allowed due to weak POPs limits)

Roads and sidewalks

Construction products

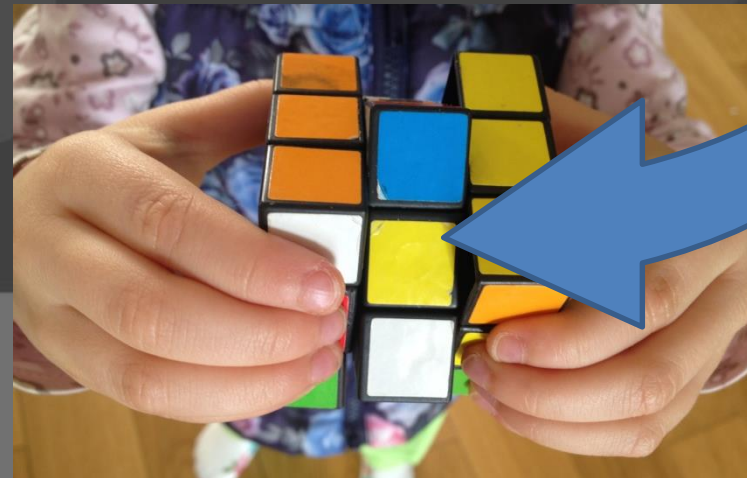
Cover layer at municipal landfills

Embankments

(Agriculture)



Recycling of POPs violates the Stockholm Convention



Low POPs content limit



“Clean”



POPs in
waste



Low POPs content limit



Hazardous

Dioxins & Planetary Boundaries



7 KG OF DIOXINS

(ANNUAL POLLUTION ALLOWED BY
PROPOSED LIMITS)

=

**133x TOLERABLE INTAKE FOR
THE ENTIRE PLANET**



STOP DIOXIN CONTAMINATION OF OUR FOOD CHAIN
DEMAND A STRICT LIMIT FOR DIOXINS IN WASTE: 0.001 MG TEQ/KG

Chemical pollution reached planetary boundary



ENVIRONMENTAL
Science & Technology

pubs.acs.org/est



Policy Analysis

- Chemical pollution has the potential to cause severe ecosystem and human health problems at different scales, but also to alter vital Earth system processes on which human life depends. “Chemical pollution” was included as one of nine planetary boundaries, in response to this understanding.

ptions
we define and apply three criteria for assessment of the suitability
of control variables for the boundary: feasibility, relevance, and

Dioxins and PCBs in eggs



New scientific study:

Dioxin pollution is not a thing of the past.

Almost 90% of the areas surveyed around the world were not safe for the production of free-range eggs.



MCON.2022.05.001





HAZARDOUS CHEMICALS IN PLASTIC PRODUCTS

BROMINATED FLAME RETARDANTS IN CONSUMER
PRODUCTS MADE OF RECYCLED PLASTIC FROM
ELEVEN ARABIC AND AFRICAN COUNTRIES

May 2022



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Migration of hazardous contaminants from WEEE contaminated polymeric toy material by mouthing

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HIGHLIGHTS

- Saliva migration study on chemical mixtures in WEEE contaminated toys.
- Up to 11 additives were found in saliva after 1 h mouthing a WEEE contaminated toy.
- 246-TBP, TBBPA, BPA, TPHP, DEHP, and DIBP were predominantly detected in saliva.
- The highest estimated daily intake was found for BPA followed by DEHP, DIBP, TBBPA.
- 246-TBP migrates in correspondence to the presence of TTBP-TAZ.

GRAPHICAL ABSTRACT



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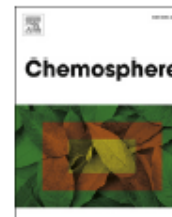


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Detection of high PBDD/Fs levels and dioxin-like activity in toys using a combination of GC-HRMS, rat-based and human-based DR CALUX® reporter gene assays



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H I G H L I G H T S

- We determined DR CALUX and DR_{human} CALUX REP values for PBDD/Fs.
- In sampled plastic toys, we measured high levels of PBDD/Fs using GC-HRMS.
- GC-HRMS-based TEQ calculated using PCDD/F TEF were up to 3821 pg TEQ/g.
- Bioassay equivalents up to 2550 pg TEQ/g were measured by DR CALUX® bioassays.
- Mouthing of contaminated plastics may significantly contribute to dioxins TDI.



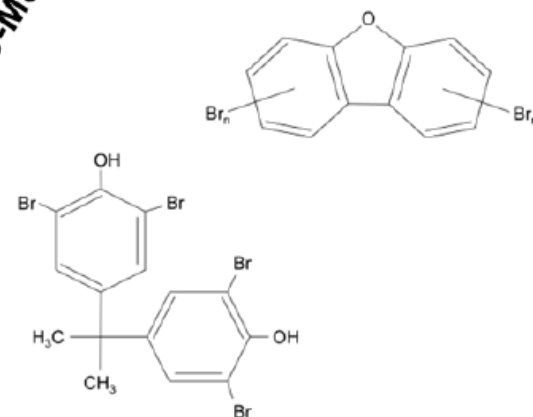
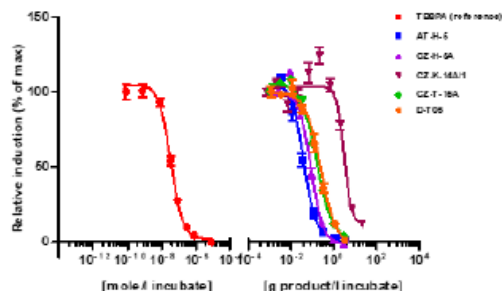
Dioxin- and thyroid hormone-like in vitro effects

Known and unknown BFRs

26 different countries on four continents (Africa, America, Asia and Europe)

DR and TTR-TR β CALUX

GC-HRMS and GC-MS-NICI



Environment International

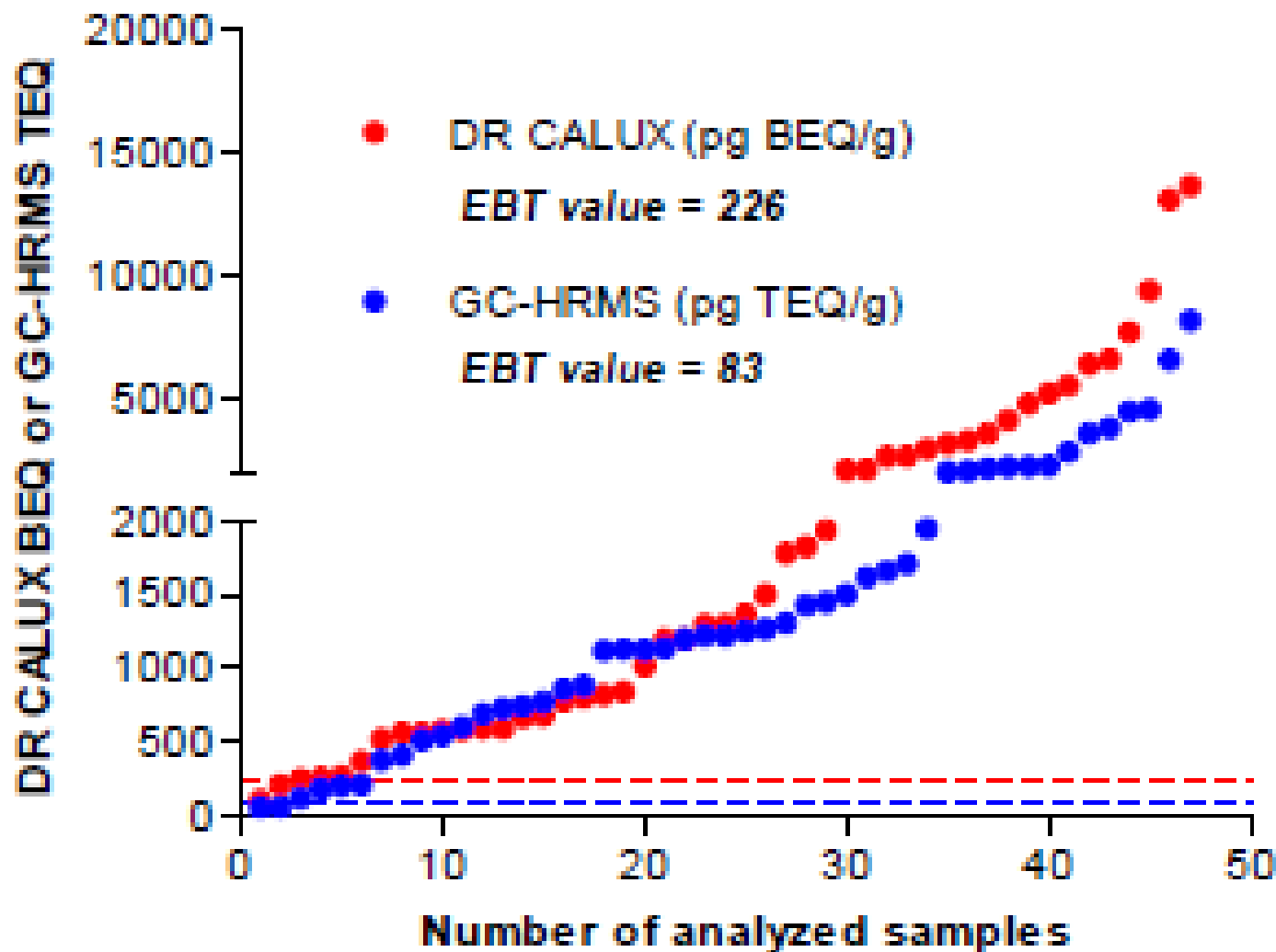
Global survey of dioxin- and thyroid hormone-like activities in consumer products and toys

Consumer products, mainly toys, kitchen utensils, hair accessories etc. made of e-waste plastics **from 26 countries**, on four continents (Africa, America, Asia and Europe)

More than **60%** contained dioxin levels above **1 ng TEQ/g** (proposed for LPCL) measured by both GC-HRMS and DR CALUX_{human}

PBDD/Fs up to 17,000 pg BEQ/g (DR CALUX_{human}) and 13,900 pg WHO-TEQ/g (GC-HRMS)

High TBBPA levels measured by TTR-TR β CALUX (max 410 mg/kg) and by chemical analysis (max 836 mg/kg)



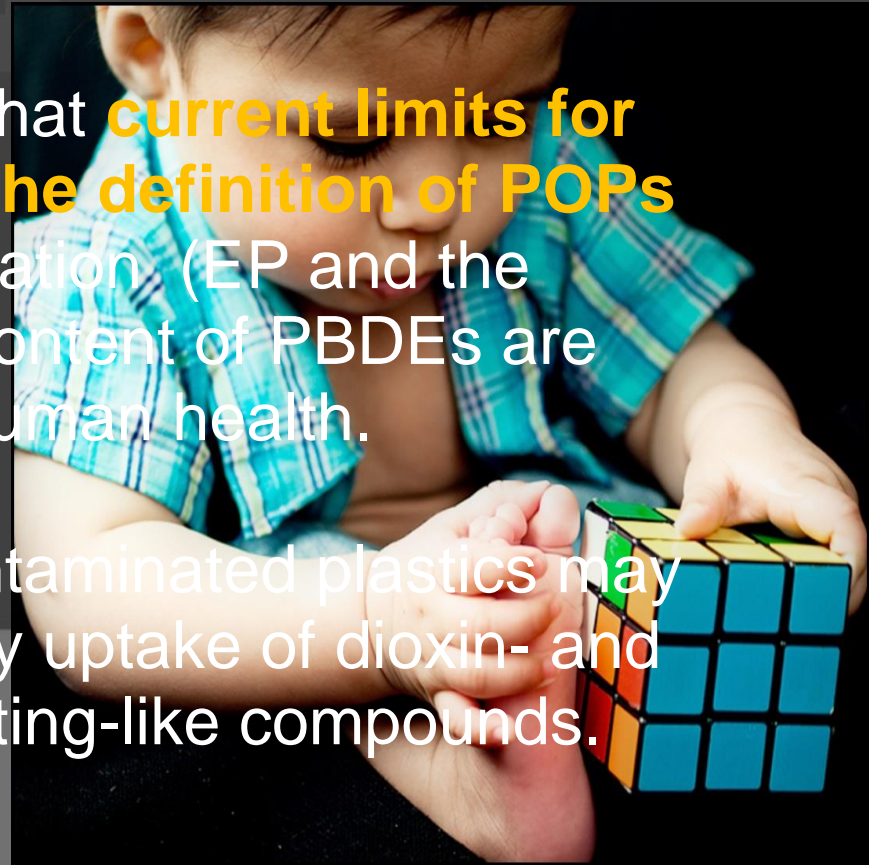
Environment International

Global survey of dioxin- and thyroid hormone-like activities in consumer products and toys

High TBBPA levels measured by TTR-TR β CALUX (max 410 mg/kg) and by chemical analysis (max 836 mg/kg)

This study add further evidence that **current limits for both trace contamination and the definition of POPs waste** set in the EU POPs Regulation (EP and the Council, 2019) and for the total content of PBDEs are **too weak** (500 ppm) to protect human health.

Mouthing by toddlers of such contaminated plastics may significantly contribute to the daily uptake of dioxin- and thyroid hormone transport disrupting-like compounds.



Toy car from Kenya 13090 pg BEQ/g DR CALUX;
6590 pg WHO-TEQ/g PBDD/Fs (GC-MS)



Noodle scoop; Tanzania 800 pg BEQ/g DR
CALUX; 210 pg WHO-TEQ/g PBDD/Fs (GC-MS)





Economic implications of limits for POPs in waste are treated unequally



**Additional costs for
special treatment of
wastes**

- **Health damage**
 - **Lost IQ**
- **Damaged ecosystems**
 - **Wildlife losts**
 - **???**

POPs waste limits

- Only strong limits for POPs – Low POPs Content Levels can solve the situation and stop the flow of POPs into recycling chain!
- 50 mg/kg for PBDEs
- 100 mg/kg for HBCD
- 0.001 mg TEQ/kg for PCDD/Fs + dl PCBs
- 100 mg/kg for SCCPs
- 0.025 mg/kg for listed PFASs and 10 mg/kg for PFASs and related compounds

**Děkuji - Thank you – Merci - Gracias -
شكراً لك - 谢谢 - Спасибо - Tack -
ありがとうございました - ขอบขอบคุณครับ**

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