

Analyzing input and output of e-recycling facility for brominated flame retardants

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E-Reciklaža 2010 e-recycling company in Serbia has collaborated with the National Institute for Environmental Studies (NIES) Japan, and obtained preliminary results with assorted plastic samples from the input - and the output plastic flakes from the process. The samples were measured for Br content (besides 9 other elements) by XRF and AQF techniques, and polymer type was determined by FTIR.

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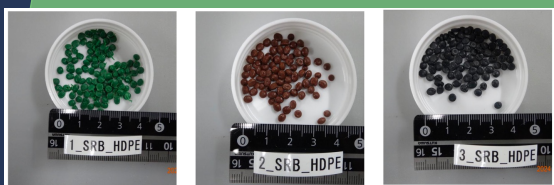
Typical input



The results reveal that most of the samples do not contain bromine or brominated flame retardants. However, some do, in significant amounts, both at the input and output. One typical example is an old CRT monitor casing at the input (ca. 400 mg/kg, bolded in Table 1). Another is found in the output - a flake resulting from mixed plastic (above 5000mg/kg, bolded in Table 1).

Table 1. Bromine contents (mg/kg) in plastic samples from Serbia collected in 2024 (excerpt).

Sample ID	Sample description	Colour	Polymer type	Br (mg/kg)
SRB24-01	TV (LCD)	Black	PS	1.0
SRB24-02	TV (CRT)	Gray	PS	604
SRB24-03	MONITOR (CRT)	Light gray	ABS	<LOD
SRB24-04	PRINTER	White	PC	3.0
SRB24-07-07	Output flake, mix.	Black	PC	5751



Typical output

The FTIR analysis confirmed that bromine in the input CRT sample originates from PBDE. In the output flake, however, besides some PBDE, most of the bromine is apparently from DBDPE and TTBP-TAZ compounds. Even though only PBDE is explicitly listed in the Stockholm Convention, the latter two are usually labelled either as SVHC (Substances of Very High Concern) or hazardous halogenated flame retardants.

