Survey on Gas Generation from RDF at the Time of Storage (1)

1. An example of the incident caused by stored RDF

There was an explosion at the silo for RDF of the electric generation plant using RDF as fuel in Mie public enterprise bureau.
Since then, they've taken measures to prevent an explosion, preserved the explosion site and monitored some gases.
Monitoring items : Temp., CO, CH_4, H_2 etc

2. Cause of the gas generation

The cause hasn't been cleared even now.

Microbe theory:CH_4, CO_2, H_2

Inorganic theory:H_2 etc.

Low-temperature oxidation theory :CO2, CO etc.

RDF stored in flexible container

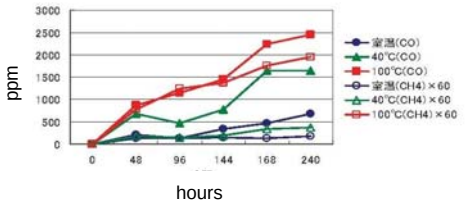
Survey on Gas Generation from RDF at the Time of Storage (2)

3. Survey on gas generation

Safe management for production, storage and use is needed.

An experiment on gas generation

(450g of RDF is in 1L bottles)



Time variation of CO and CH_4 concentration

Development of Identification Technology with Hammering for Industrial Waste Plastics(1)

1. **Conventional technology to identify industrial waste plastics**

● **Identification apparatus with near infrared ray**

→ **It can identify 20 kinds of waste plastics but the cost is high.**

2. **Developed technology with frequency analysis of hammering**

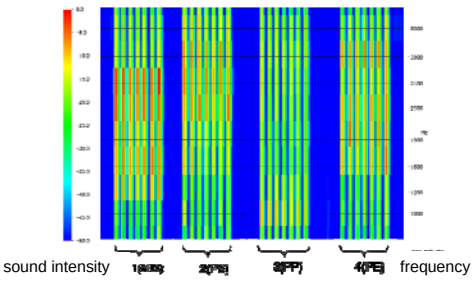
● **Material identification technology with sound intensity pattern at each octave frequency band (using a software for frequency analysis) or acoustic velocity measurement by ultrasonic wave**

→ **Low cost**

→ **It's effective to identify the material if the material is composed of a few known plastics (e.g. beer case and nursery box etc.)**

Development of Identification Technology with Hammering for Industrial Waste Plastics(2)

Identification of the material of beer case



Result of the frequency analysis for nursery box (hammering with wood rod)

Proposal for the Integrated Sorting Efficiency of Multi Sorting System (Average Recovery Rate)(1)

1. Conventional integrated sorting efficiency

Newton's integrated sorting efficiency

→Only applicable for double sorting system

In case of Figure-1, 0.9x0.8−0.1x0.2=0.7

→This means the determinant of recovery rate and shows the matrix and the surface of parallelogram. (refer to Figure-1)

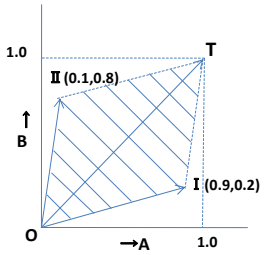


Figure-1 Vector for double sorting system

Proposal for the Integrated Sorting Efficiency of Multi Sorting System (Average Recovery Rate)(2)

2. Proposal for average recovery rate of multi sorting system

Supposing the determinant of matrix (it should be volume in case of n≧ 3) is equal, average recovery rate (m+b) can be calculated by the equation below,

$$\begin{vmatrix} m+b & b \\ b & m+b \end{vmatrix} = \begin{vmatrix} 0.9 & 0.1 \\ 0.2 & 0.8 \end{vmatrix} = d$$

m+2b=1 : double sorting system

In case of n-sorting system, average recovery rate can be calculated by the equation below,

$$m+b = \frac{1+(n-1)d^{1/(n-1)}}{n}$$

This equation is applicable for all case of n≧2)