

Supplementary data

Efficient Total Analyses for Bromine Type Flame Retardants by Simple NICI-GC/MS

Atsushi Kobayashi ^{a,b}, Tomoyuki Sato ^b, Yusuke Kitahara ^b, Shinichiro Amita ^b,
Masahiro Mori ^b, Shigeru Suzuki ^b, Takuya Kubo ^{c,*}, Koji Otsuka, ^c Ken Hosoya ^d

^a *Graduate School of Environmental Studies, Tohoku University, Aoba 6-6-20, Aramaki,
Aobaku, Sendai 9808579, Japan*

^b *Tohoku Ryokka Kannkyohozen Company, Ltd., Minamiyoshinari 6-6-3, Aobaku,
Sendai 9850842, Japan*

^c *Graduate School of Engineering, Kyoto University, Katsura, Nishikyo-ku, Kyoto
6158510, Japan*

^d *Graduate School of Life and Environmental Sciences, Kyoto Prefectural University,
Hangicho 1-5, Shimogamo, Sakyo-ku, Kyoto 6068522, Japan*

Table of contents

Experimental procedures of standard samples by 44% sulfuric acid-impregnated silica gel.

Figure S1. Fractionation results by 44% sulfuric acid-impregnated silica gel.

Fraction 1, hexane; 2, CH₂Cl₂/Hex (5/95); 3, CH₂Cl₂/Hex (10/90); 4, CH₂Cl₂/Hex (20/80); 5, CH₂Cl₂/Hex (50/50).

Experimental procedures of standard samples by 44% sulfuric acid-impregnated silica gel.

2.0 g of 44% sulfuric acid-impregnated silica gel was packed into glass column (10 mm i.d.) with *n*-hexane. 100 μ L of mixture of HBB, α -HBCB, DBDE, TBBPA (*n*-hexane solution, 1.0 ppm in each) was applied to the column, then, hexane(Hex), CH₂Cl₂/Hex (5/95), CH₂Cl₂/Hex (10/90), CH₂Cl₂/Hex (20/80), CH₂Cl₂/Hex (50/50) was eluted the column as 10 mL fraction. Each fraction was purged with N₂ gas, 100 μ L PCB#209 solution (500 ppb) was syringe spiked. Finally, the total volume of each sample was adjusted at 1.0 mL and GC/MS analyses were carried out. The fractionation results are summarized in Figure S1. HBB, α -HBCB, and DBDE can be eluted at first fraction treated by *n*-hexane. On the other hand, TBBPA was eluted at fourth fraction treated by CH₂Cl₂/Hex (20/80) because of its polarity. Therefore, when we use the fractionation method, CH₂Cl₂/Hex (20/80) was utilized for an elution solvent.

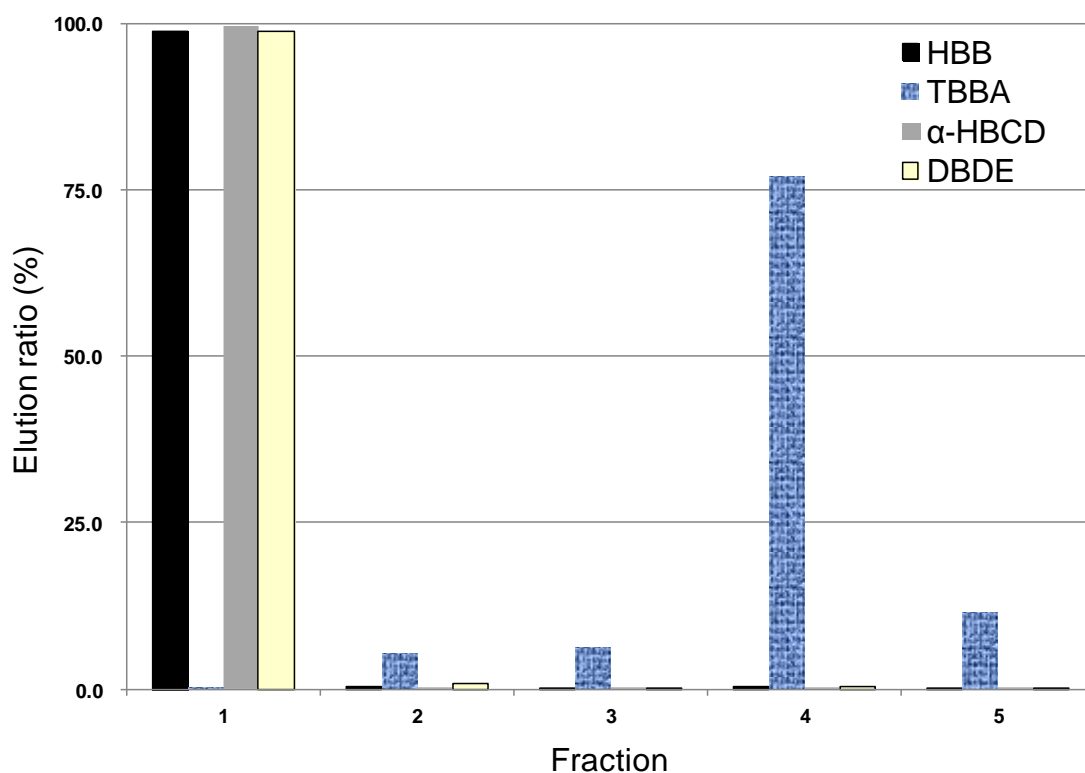


Figure S1. Fractionation results by 44% sulfuric acid-impregnated silica gel