

図1 Bisphenol A標準溶液及びび器からの溶出溶液のHPLCクロマトグラム

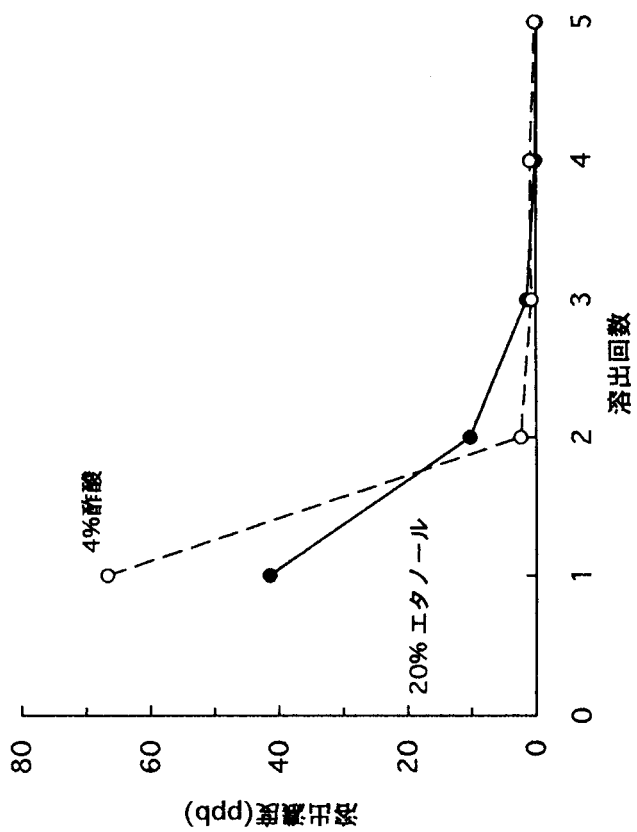


図2 繰り返し溶出試験

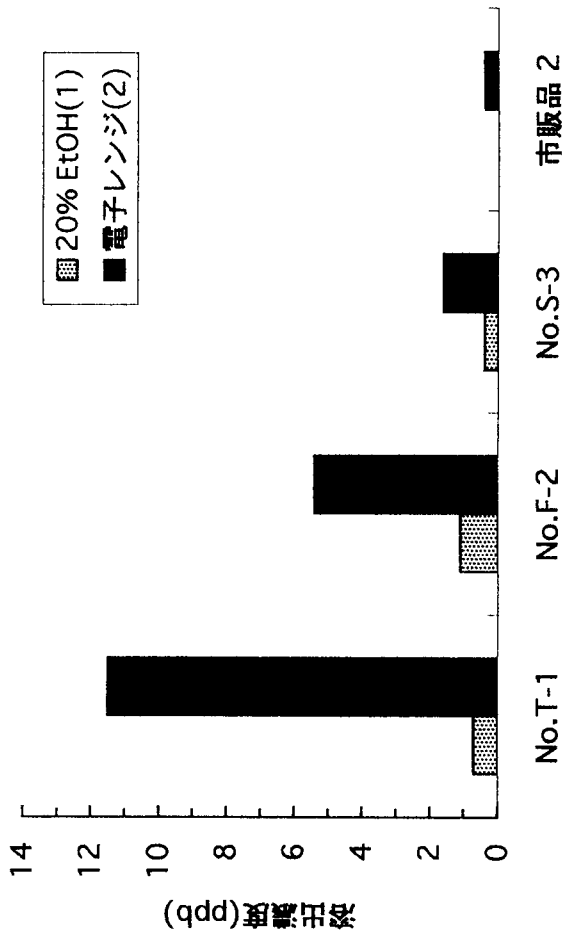


図3 食器からのBPAの溶出(電子レンジの影響)

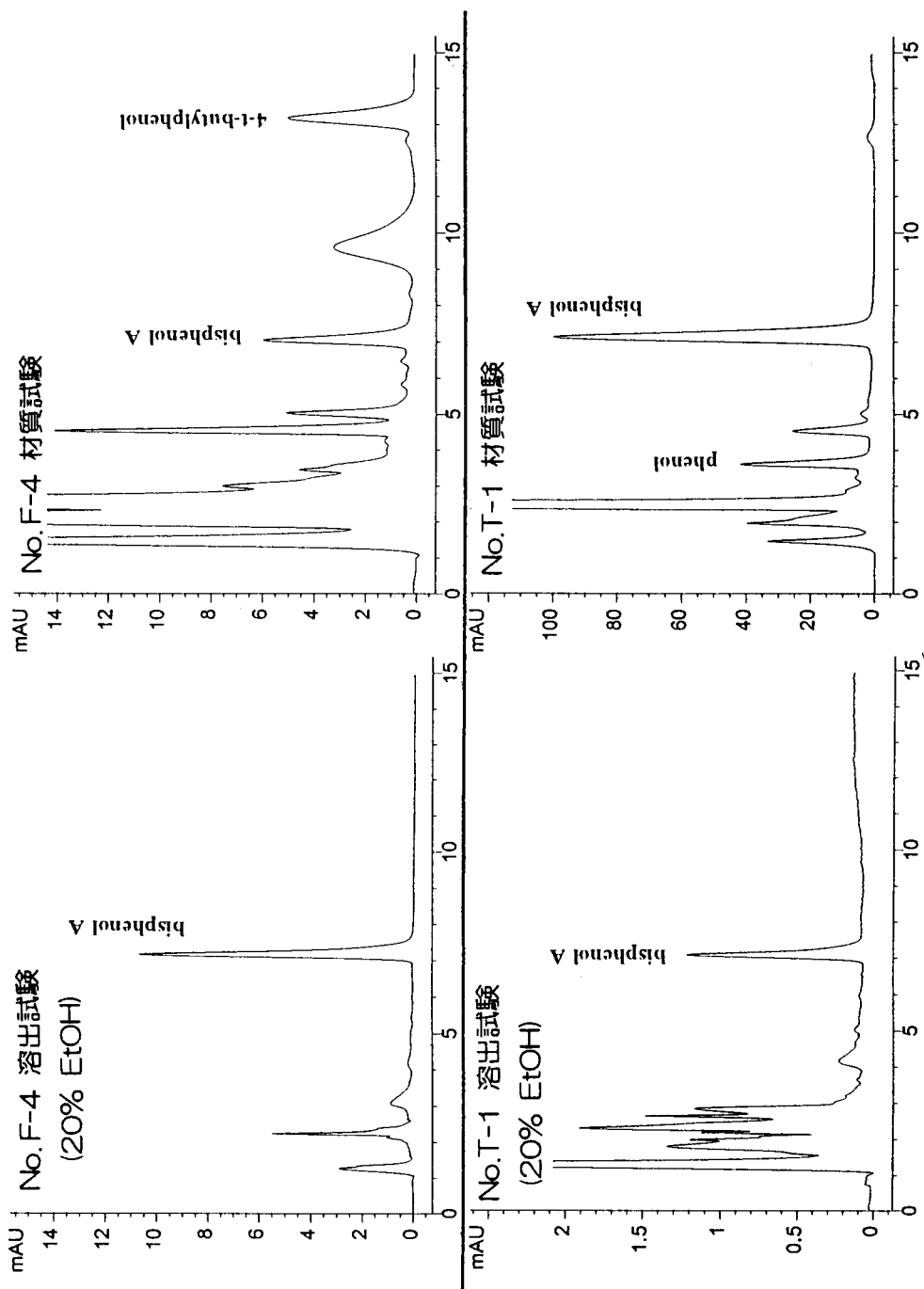


図4 Bisphenol Aの溶出試験結果と材質試験結果の比較

表1 LC/MS測定条件

Apparatus: HP1100 Series LC/MSD (Hewlett Packard)

MS Conditions	HPLC Conditions
Ionization Mode : ESI, Negative Mode	Column : Zorbax XDB-C18 (150 x 2.1 mm)
Fragmentor : 80 V	Eluent : 0.01% acetic acid-MeCN (60:40)
Nebulizer : N ₂ (35 psi)	Flow rate : 0.2 mL/min
Drying gas : N ₂ (10L/min, 350°C)	Oven temp. : 40°C
V-cap : 4250 V	Injection size : 10 μL
SIM ion : m/z 227	

表2 使用中のポリカーボネート製食器からのBisphenol Aの溶出量

試料 No.	溶出量 (ppb)			
	95℃熱湯	20% EtOH	4% 酢酸	n-ヘプタン
K-1	2.5	2.1	2.4	N.D.
K-2	1.0	N.D.	N.D.	N.D.
K-3	1.0	N.D.	N.D.	N.D.
K-4	N.D.	N.D.	N.D.	N.D.
T-1	7.0	8.6	13.7	1.9
T-2	N.D.	N.D.	N.D.	N.D.
T-3	N.D.	N.D.	1.4	N.D.
T-4	1.7	4.5	1.4	N.D.
F-1	N.D.	N.D.	N.D.	N.D.
F-2	10.5	3.8	7.8	N.D.
F-3	1.0	N.D.	1.6	N.D.
F-4	23.0	41.5	66.7	1.9
O-1	1.8	1.8	N.D.	N.D.
O-2	N.D.	N.D.	N.D.	N.D.
O-3	N.D.	N.D.	N.D.	N.D.
O-4	N.D.	N.D.	N.D.	N.D.
S-1	N.D.	N.D.	N.D.	N.D.
S-2	N.D.	N.D.	N.D.	N.D.
S-3	2.2	1.8	1.5	N.D.
S-4	N.D.	N.D.	N.D.	N.D.
G-1	N.D.	N.D.	N.D.	N.D.
G-2	1.9	1.5	1.3	N.D.
G-3	N.D.	N.D.	N.D.	N.D.
G-4	N.D.	N.D.	N.D.	N.D.
G-5	N.D.	N.D.	N.D.	N.D.

N.D. : 1ppb以下

表3 市販容器・箸からのBisphenol Aの溶出

溶出量(ppb)

試料 No.	試料名	95℃熱湯	20% EtOH	4% 酢酸	n-ヘプタン
1	マグカップ	N.D.	N.D.	N.D.	1.2
2	マグカップ	N.D.	N.D.	N.D.	N.D.
3	密閉容器	N.D.	N.D.	N.D.	N.D.
4	密閉容器	N.D.	N.D.	N.D.	N.D.
5	計量カップ	N.D.	N.D.	N.D.	N.D.
6	哺乳瓶	N.D.	N.D.	N.D.	N.D.
7	哺乳瓶	N.D.	N.D.	N.D.	N.D.
8	密閉容器	N.D.	N.D.	N.D.	N.D.
9	マグカップ	N.D.	N.D.	N.D.	N.D.
10	計量カップ	N.D.	N.D.	N.D.	N.D.
11	すり鉢	1.2	N.D.	N.D.	N.D.
12	乳吸器	N.D.	N.D.	N.D.	N.D.
13	トレー	N.D.	N.D.	N.D.	N.D.
14	スプーン	N.D.	N.D.	N.D.	N.D.
15	箸 (エポキシ塗装)	48.6	42.7	101	2.8
16	箸 (エポキシ塗装)	10.3	1.5	1.6	N.D.
17	箸 (エポキシ塗装)	37.6	369	62.8	56.3
18	箸 (エポキシ塗装)	1.5	N.D.	N.D.	N.D.
19	箸 (エポキシ塗装)	N.D.	N.D.	N.D.	N.D.
20	箸 (エポキシ塗装)	N.D.	N.D.	N.D.	N.D.
21	箸 (エポキシ塗装)	N.D.	N.D.	N.D.	N.D.
22	箸 (エポキシ塗装)	47.1	52.6	33.3	8.5
23	箸 (エポキシ塗装)	16.5	13.7	1.6	1.0
24	箸 (エポキシ塗装)	1.2	N.D.	N.D.	N.D.
25	箸 (エポキシ塗装)	N.D.	N.D.	N.D.	N.D.

N.D.: 1ppb以下

表4 繰り返し溶出試験（浸出溶液 20%エタノール）

管 (No.)	溶出量(ppb)					
	1回目	2回目	3回目	4回目	5回目	6回目
15	42.7	45.9	14.3	N.D.	1.1	N.D.
17	369	545	124	26.3	22.5	50.9
22	52.6	59.2	15.9	2.5	3.7	12.7
23	13.7	11.9	7.9	5.1	4.7	3.9

N.D.: 1ppb以下

表5 Bisphenol Aの材質中濃度と溶出量の比較

試料 No.	平均溶出量 (ppb)	材質中濃度 (ppm)	備考
T-1	7.8	97.3	乳白色
T-4	1.9	26.5	"
F-2	5.5	13.4	"
F-4	33.3	10.6	"
T-2	N.D.	23.5	"
O-3	N.D.	24.1	"
S-1	N.D.	42.7	"
市販品 No.2	N.D.	1.8	淡緑色透明
市販品 No.13	N.D.	24.6	乳白色