Analysis of corn flavor compositions by GC-MS

1 Instruments and reagents

GC-MS3100 gas chromatograph/mass spectrometer; 1 μL microinjector; corn flavor sample

2 Analysis conditions

MS conditions： EI source; ion source temperature: 200℃; electron energy: 70eV; scanning mode：full scan; scanning range: 28.5u～400u; scanning period: 0.6 s; interface temperature: 280℃; multiplier high voltage: 1050V; solvent delay: 1.45 min; scan start time: 1.7 min.

GC： Equity-5 (30m×0.25mm×0.25um) silica capillary column; injection port temperature: 280℃; split sampling; sample volume: 0.06 μL; split ratio: 50:1; precolumn pressure: 60 kPa; purge rate：2ml/min; column temperature program: hold at 35℃ for 2 min, ramp up to 270 °C at 7 °C/min and then hold for 5 min.

3 Analysis results

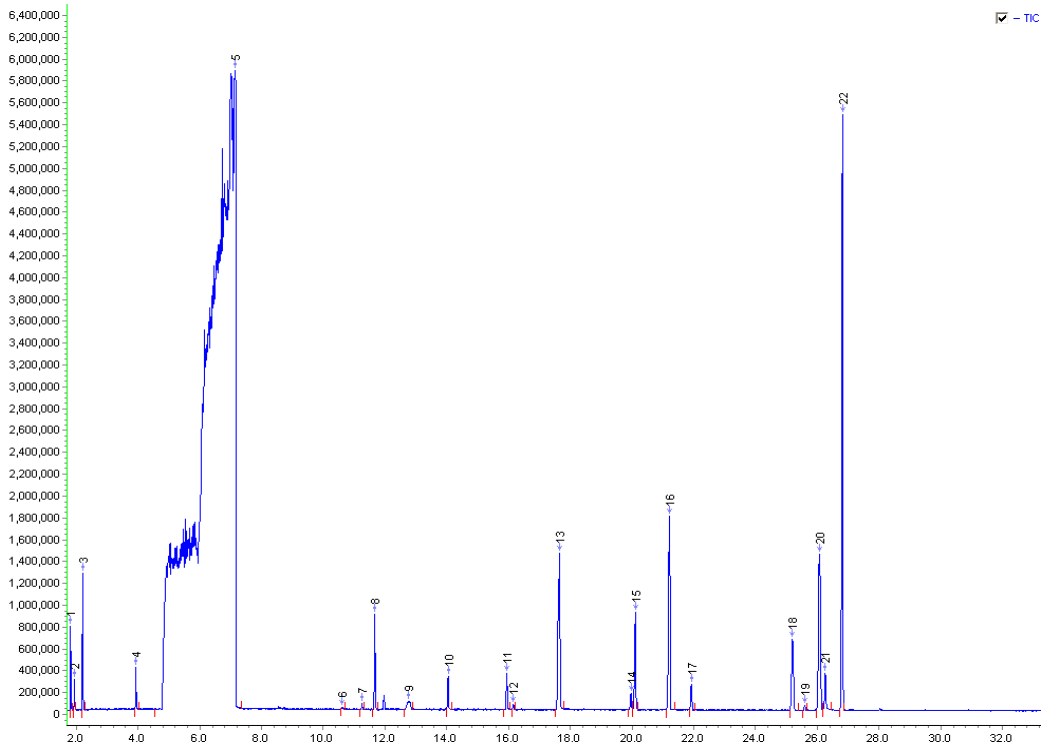

Figure 1 Corn flavor TIC chromatogram

As weakly polar capillary column was used in this experiment, the peak shape of individual components with higher polarity in the sample are not ideal (such as 1,2-propanediol). It

would be better if polar columns were used. Meanwhile, the identified components were subjected to normalized quantification, and NIST standard library search for qualification. Most of the components has matching degree of more than 85%.

Table 1 Analysis results of corn flavor composition

Peak No	Retention time, min	Name	CAS No.	Molecular formula	relative amount, %	similarity degree, %
1	1.82	Isopropyl Alcohol	67-63-0	C_3H_8O	0.26	95
2	1.94	Dimethyl sulfide	75-18-3	C_2H_6S	0.09	96
3	2.20	1-Propanol	71-23-8	C_3H_8O	0.39	95
4	3.93	2,3-Pentanedione	600-14-6	$C_5H_8O_2$	0.14	91
5	7.14	Propylene Glycol	57-55-6	$C_3H_8O_2$	89.4	92
6	10.62	1-Propanol, 3-(methylthio)-	505-10-2	$C_4H_{10}OS$	0.01	86
7	11.25	Pyrazine, 2-ethyl-3-methyl-	15707-23-0	$C_7H_{10}N_2$	0.02	95
8	11.67	Acetylpyrazine	22047-25-2	$C_6H_6N_2O$	0.41	91
9	12.76	Ethanone, 1-(1H-pyrrol-2-yl)-	1072-83-9	C_6H_7NO	0.12	92
10	14.04	Maltol	118-71-8	$C_6H_6O_3$	0.14	92
11	15.94	4H-Pyran-4-one, 2-ethyl-3-hydroxy-	4940-11-8	$C_7H_8O_3$	0.17	93
12	16.15	5,6,7,8-Tetrahydroquinoxaline	34413-35-9	$C_8H_{10}N_2$	0.03	91
13	17.65	5-Thiazoleethanol, 4-methyl-	137-00-8	C_6H_9NOS	1.40	92
14	19.96	4-Thiazoleethanol, 5-methyl-, acetate	94021-41-7	$C_8H_{11}NO_2S$	0.08	87
15	20.10	3-Hydroxy-4-methoxymandelic acid	3695-24-7	$C_9H_{10}O_5$	0.54	93
16	21.21	Ethyl Vanillin	121-32-4	$C_9H_{10}O_3$	1.35	94
17	21.92	2H-Pyran-2-one, tetrahydro-6-pentyl-	705-86-2	$C_{10}H_{18}O_2$	0.13	90
19	25.59	2H-Pyran-2-one, 6-heptyltetrahydro-	713-95-1	$C_{12}H_{22}O_2$	0.03	81
21	26.26	Tetradecanoic acid	544-63-8	$C_{14}H_{28}O_2$	0.23	92
22	26.81	Tetradecanoic acid, ethyl ester	124-06-1	$C_{16}H_{32}O_2$	2.91	89