



HJ/T 400—2007

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**Determination of Volatile Organic Compounds and Carbonyl Compounds in  
Cabin of Vehicles**

2007-12-07

2008-03-01

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	.....	I
1	.....	1
2	.....	1
3	.....	1
4	.....	1
5	.....	4
6	.....	4
A	.....	6
A.1	.....	6
A.2	.....	6
B	.....	7
B.1	.....	7
B.2	.....	7
B.3	.....	7
B.4	.....	7
B.5	.....	8
B.6	.....	8
B.7	.....	9
B.8	.....	10
B.9	.....	10
B.10	.....	11
B.11	.....	11
B.12	.....	12
C	.....	14
C.1	.....	14
C.2	.....	14
C.3	.....	14
C.4	.....	14
C.5	.....	15
C.6	.....	15
C.7	.....	15
C.8	.....	16
C.9	.....	17
C.10	.....	18
C.11	.....	18
C.12	.....	18
D	.....	21

2008 3 1  
2007 12 7



1

2

GB/T 15089

3

3.1 M M2 M3 N

GB/T 15089

M

M2

5000 kg

M3

5000 kg

N

3.2

tenax

10

3.3

C

4

4.1

4.1.1

4.1.2

- a) 25.0 ± 1.0
- b) 50% ± 10%
- c) 0.3m/s
- d) 0.02mg/m<sup>3</sup>      0.02mg/m<sup>3</sup>

4.2

4.2.1

- a) M<sub>1</sub>      1      (
- )
- b) M<sub>2</sub>      2
- c) M<sub>3</sub>      3      M<sub>3</sub>      6

- d) N      1

4.2.2

4.3

4.3.1

A

4.3.2

4.3.2.1

4.3.2.2      50ml/min~1000ml/min

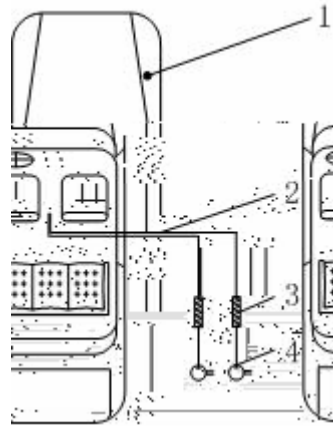
5

4.3.2.3

1

4.3.2.4

4.3.2.5      B      C



1—                      2—                      3—                      4—

1

4.4

4.4.1

a)

b)

c)

d)

4h

6h

4.1.2

6.7

4.4.2

a)

b)

4.3.2

c)

16h

d)

4.1.2

6.7

4.4.3

4.1.2

B

C

100 ml/min ~200ml/min

30min

100ml/min ~500ml/min

30min

5%

0.5m

4.5

<4

30

5

5.1

B

5.2

C

6

6.1

6.2

6.3

6.4

( )

6.5

2

6.6

2

20%

6.7

6.7.1

6.7.2

4



4h

1

1

6.7.3

1

0.5m

5

1

0.5m

6.8

$$V_0 = V \cdot \frac{T_0}{T} \cdot \frac{P}{P_0}$$

:

$V_0$  —

L

$V$  —

L

$T_0$  —

273K

$T$  —

t

t+273 K

$P_0$  —

101.3kPa

$P$  —

kPa

6.9

D

A

A 1

A 1.1

0.5m

4.1.2

A 1.2

A 1.3

A 1.4

0.5m

4.1.2

A 1.5

25

±1.0

50%

±10%

2

1

0.5m

A 1.6

4.1.2

0.5m

A 2

B

B.1

1.5 g/m<sup>3</sup>

3L

B.2

B.2.1

B.2.2

6mm

200mg

B.2.3

<3mm

B.2.4

<10

50m

60m

0.20mm~0.32mm

0.2 m~1.8 m

B.2.5

TIC

B.3

B.4

B.4.1

·  
·  
·  
·  
·  
·

B. 4. 2

60~80

B.2

B. 4. 3

99.999%

B. 5

B. 5. 1

B. 5. 2

—

B. 5. 2. 1

B. 5. 2. 2 /

/

B. 5. 3

± 5

50 ml/min -100ml/min

B. 6

8

B.1

B.1

	250	325
	5min	15min
	30ml/min	50 ml/min
	20	180
	250	350

B. 7

B. 7. 1

< 10    50m   60m                          0.20mm~0.32mm                          0.2 m~1.0 m

50                          10min                          5                          min    250

B. 7. 2

35amu~350amu    70eV

B. 7. 3

B. 7. 3. 1    100 g/m<sup>3</sup>    100ml   400ml   1L   4L   10L

B. 7. 3. 2

RF

0.995

B. 7. 3. 3

$\alpha = 5\%$

B. 7. 3. 4

20

$\bar{x}$

2

3

4

B.7.4

B.8

B.8.1

$$c_m = \frac{m_F - m_B}{V} * 1000$$

$c_m$  — mg/m<sup>3</sup>

$m_F$  — mg

$m_B$  — mg

$V$  — L

$$c_c = c_m \cdot \frac{p_0}{p} \cdot \frac{T}{T_0}$$

$c_c$  — mg/m<sup>3</sup>

$p_0$  — 101.3kPa

$p$  — kPa

$T_0$  — 273K

$T$  — t + 273 K

B.8.2

a 50 260 5 g/m<sup>3</sup>

b 25

c

d

B.9

B.9.1

3L 1.5 g/m<sup>3</sup>

B.9.2

10

$10^3$   
B. 9. 3

0.5 g

B.12

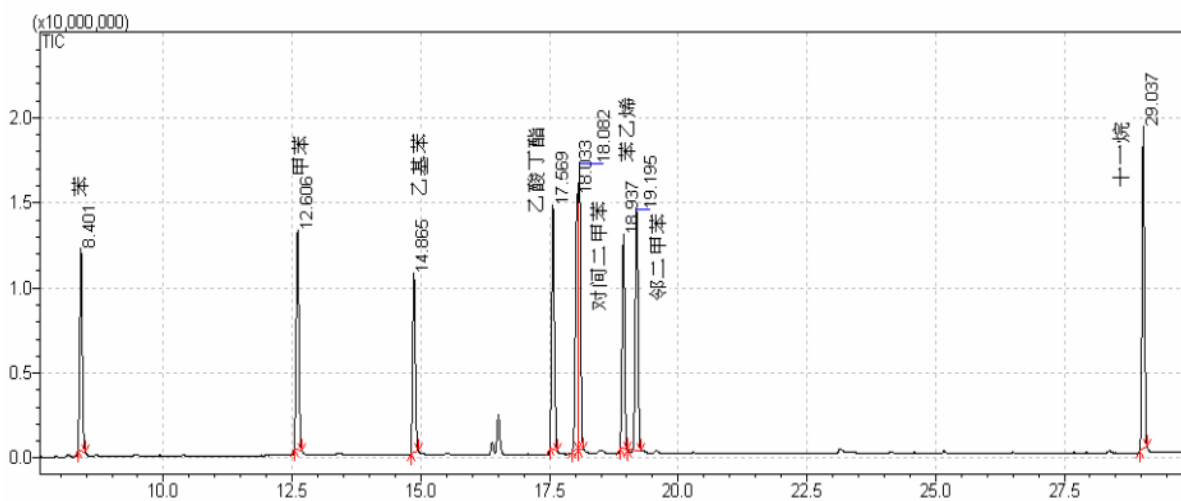
ISO16000-6 2004



B.2

Carbotrap	
Carbopack	
Carbograph TD-1	
Carbosieve S-	
Carboxen 569	
Carboxen 1000	
Chromosorb 102	/
Chromosorb 106	
Porapak N	
Porapak Q	/
Spherocarb	
Tenax TA	
Tenax GR	

Carbotrap™ Supelco Inc.  
 Carbopack™ Enka Research Institute NV NL  
 Carbograph TD-1™ Chromosorb™ Manville Corp.  
 Carbosieve S-™  
 Carboxen™  
 Chromosorb™  
 Porapak™ WatersAssociates Inc. Spherocarb™ Analabs Inc.  
 Tenax™



B.1

TIC

C

C.1

15

C.2

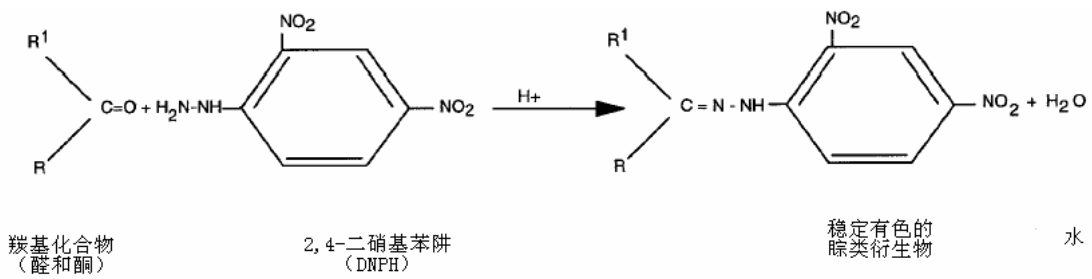
C.2.1 DNP

2,4-

C.3

DNP

DNP



R R<sup>1</sup>

C.4

C.4.1 DNP

DNP

- 0.15μ g/
- 0.10μ g/
- 0.30μ g/
- 0.10μ g/

C.4.2

HPLC

UV

1.5ng/ml

C.4.3

14

2,4-

.  
.
   
.
   
.
   
.
   
.
   
.

C. 4. 4

0.45 m

C. 5

C. 5. 1

HPLC

C<sub>18</sub>

C.1

C. 5. 2

10 1 50 1 100 1

C. 5. 3

5ml

C. 5. 4

C. 5. 5

C. 6

C. 6. 1

C. 6. 2

5ml

5ml

0.45 m

3min-5min

C. 6. 3

5ml

C. 6. 4

4

30d

C. 7

C. 7. 1

a)

C<sub>18</sub>

b)

/

c)

60% /40%

d) 360nm  
 e) 1.0 ml/min  
 f) 25 μl  
 C. 7. 2  
 C. 7. 2 1

3min-5min  
 C. 7. 2 2

5ml  
5ml

5ml  
0.45 m

C. 7. 2 3 5

RF

C. 7. 2 4 0.995

$\alpha = 5\%$

C. 7. 2 5

20

$\bar{x}$

1

2

3

4

C. 7. 3

C. 8

C. 8. 1

$$c_m = \frac{m_F - m_B}{V} * 1000$$

$c_m$  ——— mg/m<sup>3</sup>

$m_F$  ——— mg

$m_B$  ——— mg

$V$  ——— L  
 DNPH

N

$\sqrt{N}$

200

$\sqrt{200}$  14

$$c_c = c_m \cdot \frac{p_0}{p} \cdot \frac{T}{T_0}$$

$c_c$  —

mg/m<sup>3</sup>

$p_0$  —

101.3kPa

$p$  —

kPa

$T_0$  —

273K

$T$  —

t

t+273 K

C.8.2

C.9

C.9.1

3

$$c_{\min} = 2N \frac{Cv}{hV}$$

$c_{\min}$  —

mg/m<sup>3</sup>

N —

AU

C —

μg/ml

v —

ml

$\bar{h}$  —

AU

V —

L

C.9.2

10

6

Grubbs

1%

C.9.3

20

3

C.7.2.5

C. 10

C. 10. 1

a) DNPB

b)

		1.5ng/ml		
		DNPB	UV	40 -60
	DNPB	UV		HPLC

DNPB

0.15μ g

d)

e)

C. 10. 2

$$N = 5.54 \left( \frac{t_R}{W_{1/2}} \right)^2$$

N \_\_\_\_\_

$W_{1/2}$  \_\_\_\_\_ s

$t_R$  \_\_\_\_\_ s

5,000

C. 10. 3

150ng/ml

HPLC

± 10%

75ng/ml

HPLC

25%

± 7%

C. 11

a)

b)

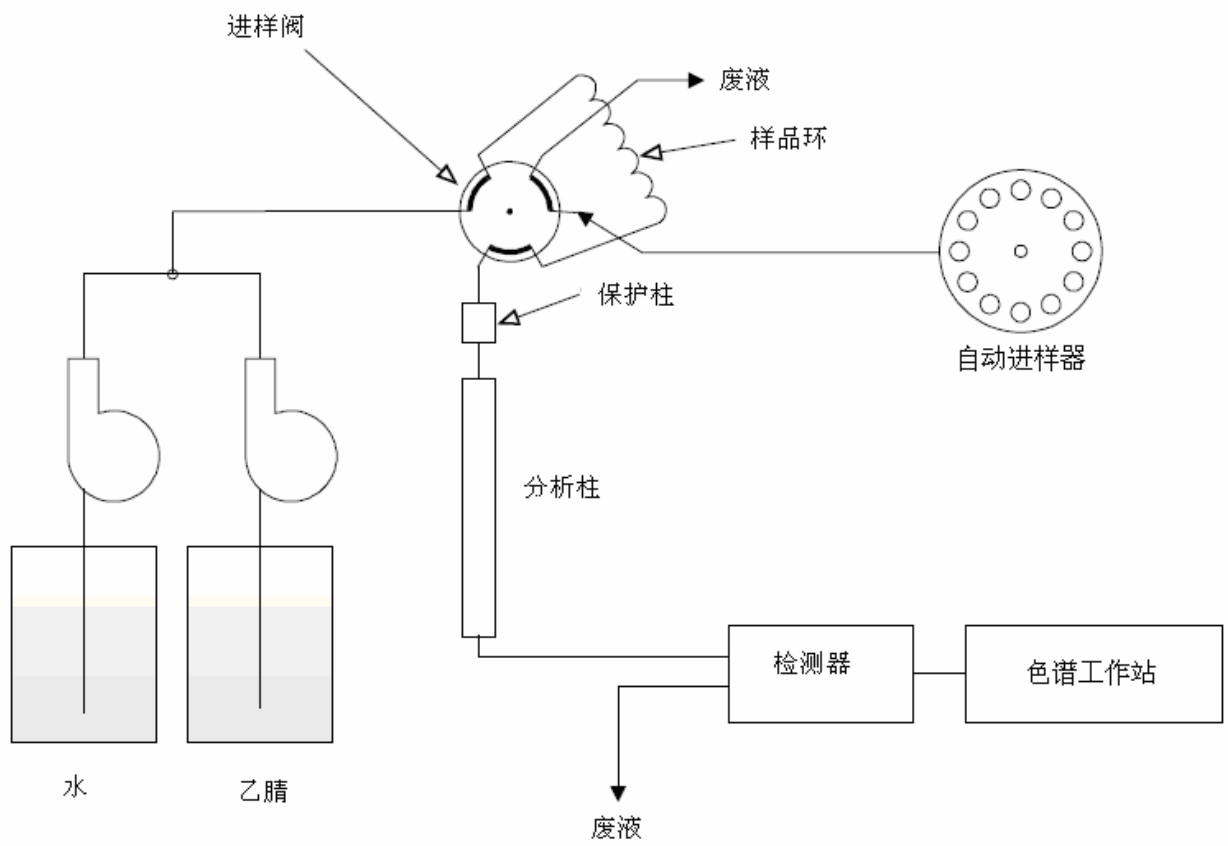
c)

C. 12

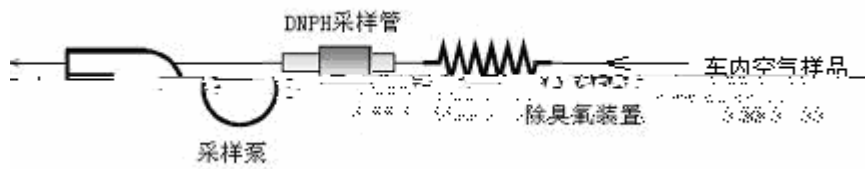
ISO16000-3 Determination of Formaldehyde and other carbonyl compounds—Active sampling method.

USEPA TO-11A Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology].

" 2 4-DNPB "

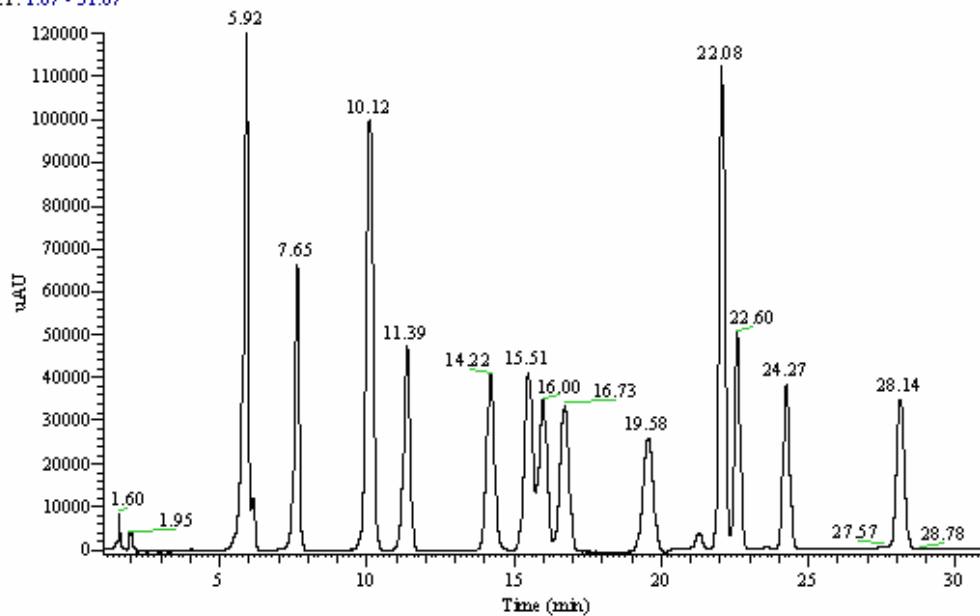


C 1



C 2 DNPH

RT: 1.07 - 31.07



NL:  
1.20E5  
Channel A  
UV  
yuanye-01

C.3 DNPH

min		min	
5.92		16.73	
7.65		19.58	
10.12	+	22.08	
11.39		22.60	
14.22		24.27	
15.51		28.14	
16.00			



D

VIN		km		L									
	t			%	m/s								
	t			%	m/s			P	kPa				
					L/min			min	V L				
	( )												

\_\_\_\_\_