

HJ 896-2017

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**Water quality—Determination of butyl xanthate—Purge and trap/
gas chromatography-mass spectrometry**

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2017-12-21

2018-02-01

	ii
1	1
2	1
3	1
4	1
5	1
6	2
7	3
8	3
9	5
10	7
11	8
12	8
13	8

/ -

2017 12 21
2018 2 1

1

/ -

/ -

25 g/L

5 ml

0.04 µg/L

0.16 µg/L

2

HJ/T 91

HJ/T 164

3

CS₂

CS₂

CS₂

CS₂

CS₂

4

CS₂

5~20 mg

5

5.1 CH₃OH

5.2 H₃PO₄ ρ= 1.69 g/ml

5.3 NaOH

5.4 Na₂S₂O₃·5H₂O

5.5		C_4H_9OCSSK		95%			
5.6		1+6					
5.7		$\rho(NaOH)=400\text{ g/L}$					
	10 g	5.3		25 ml			
5.8		$\rho(NaOH)=40\text{ g/L}$					
		5.7					
5.9		$\rho(NaOH)=0.08\text{ g/L}$					
	200 μl	5.7		1L			
5.10		$\rho(C_4H_9OCSSH)=100\text{ }\mu\text{g/ml}$					
	0.0330 g	5.5		100 μl		5.7	
	250 ml	4°C					
5.11		$\rho(C_4H_9OCSSH)=10.0\text{ }\mu\text{g/ml}$					
		5.9		5.10			
5.12		$\rho(C_4H_9OCSSH)=1.00\text{ }\mu\text{g/ml}$					
		5.9		5.11			
5.13		$\rho=100\text{ }\mu\text{g/ml}$					
5.14		$\rho=10.0\text{ }\mu\text{g/ml}$					
	5.1			5.13			
5.15		99.999%					
5.16		99.999%					
6							
6.1	-		/			EI	
6.2		5 ml		1/3Tenax	1/3	1/3	
6.3		60 m	0.20 mm	1.12 μm	6%	/94%	
6.4	40 ml						
6.5		50 ml	250 ml				
6.6	20 μl	100 μl	500 μl				

6.7

7

7.1

HJ/T 91 HJ/T 164

6.4

5.8

pH 10

7.2

4°C

1d

5~20 mg

5.4 4°C

8

8.1

8.1.1

5 ml

40°C

40 ml/min

11 min

180°C

1 min

190 °C

10 min

8.1.2

40°C

1.0 min

5°C/min

120°C

1.0 min

20°C/min

250°C

2.0 min

230°C

1.0 ml/min

10:1

8.1.3

EI

70 eV

230°C

280°C

30-300 amu

150°C

6 min

9.2

8.2

5.11 5.12

5.9 50 ml

6.5

5.9

0.20 µg/L 1.00 µg/L 2.00 µg/L

10.0 µg/L 20.0 µg/L

5.12

0.01 ml 0.05 ml 0.10 ml 0.50 ml

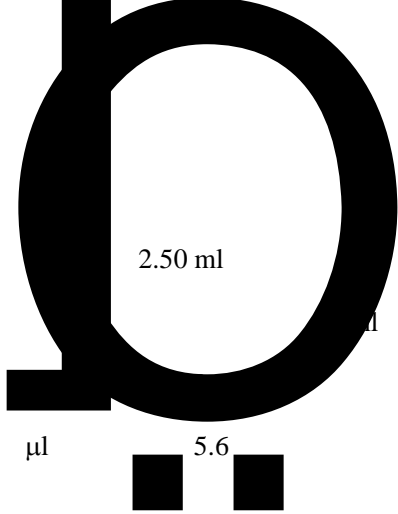
1.00 ml

10.0 µg/L 50.0 µg/L 100

µg/L 200 µg/L 500 µg/L

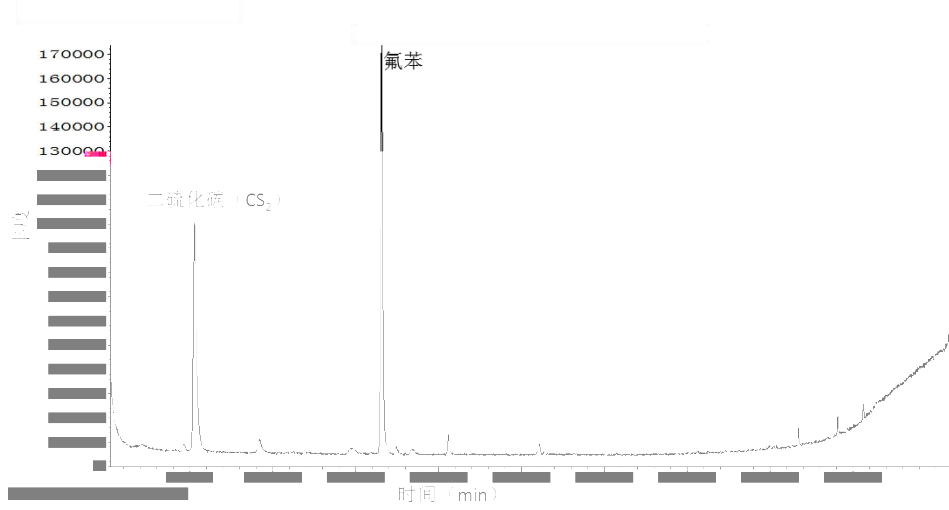
5.11

0.05 ml 0.25 ml 0.50 ml



6.4
5.14
8.1
5.6
5.6
5 μg/L
6.6
200 μl
6.6
100
CS₂

1



1

8.2.1

i RRF_i 1

$$RRF_i = \frac{A_i}{A_{ISi}} \times \frac{\rho_{IS}}{\rho_i} \quad 1$$

RRF_i — i CS₂

A_i — i CS₂

A_{ISi} — i

ρ_{IS} — μg/L

ρ_i — i μg/L

\overline{RRF} —
 RRF_i — i CS₂
 n —
 RRF 3

$$SD = \sqrt{\frac{\sum_{i=1}^n (RRF_i - \overline{RRF})^2}{n-1}} \quad 3$$

SD — RRF
 \overline{RRF} —
 RRF_i — i CS₂
 n —
 RRF 4

$$RSD = \frac{SD}{RRF} \times 100\% \quad 4$$

RSD — RRF
 SD — RRF
 \overline{RRF} —

8.2.2

RRF $RSD > 20\%$
 CS_2 >

8.3

8.2 >

±3

10%

±30%

9.2

1

1

		76	32 44
		96	70

9.2.1

ρ_x 5

$$\rho_x = \left(\frac{A_x}{A_{ISx}} - \frac{A_o}{A_{ISo}} \right) \frac{\rho_{IS} \times f}{RRF}$$

5

ρ_x — $\mu\text{g/L}$

A_x — CS_2

A_{ISx} —

A_o — CS_2

A_{ISo} —

ρ_{IS} — $\mu\text{g/L}$

f —

\overline{RRF} —

9.2.2

ρ_x 6

$$\rho_x = \left(\frac{A_x}{A_{ISx}} - \frac{A_o}{A_{ISo}} - b \right) \times \frac{f}{a}$$

6

ρ_x ————— $\mu\text{g/L}$

A_x ————— CS_2

A_{ISx} —————

A_o ————— CS_2

A_{ISo} —————

b —————

f —————

a —————

9.3

< 1 $\mu\text{g/L}$

2

1 $\mu\text{g/L}$

3

10

10.1

6

1.00 $\mu\text{g/L}$ 20.0 $\mu\text{g/L}$ 400 $\mu\text{g/L}$

3.3%~8.4% 1.9%~5.6% 0.7%~3.7%

5.6% 3.6% 1.9%

0.17 $\mu\text{g/L}$ 2.2 $\mu\text{g/L}$ 18 $\mu\text{g/L}$

0.29 $\mu\text{g/L}$

4.3 $\mu\text{g/L}$ 50 $\mu\text{g/L}$

6

1.00 $\mu\text{g/L}$ 5.00 $\mu\text{g/L}$

1.6%~14% 1.0%~7.2%

12% 10%

0.30 $\mu\text{g/L}$ 0.59 $\mu\text{g/L}$

0.41 $\mu\text{g/L}$ 1.3 $\mu\text{g/L}$

6

1.00 $\mu\text{g/L}$ 5.00 $\mu\text{g/L}$

3.0%~11% 1.7%~6.8%

7.1% 5.5%

0.18 $\mu\text{g/L}$ 0.51 $\mu\text{g/L}$

0.23 $\mu\text{g/L}$ 0.78 $\mu\text{g/L}$

6

10.0 $\mu\text{g/L}$ 100 $\mu\text{g/L}$

1.4%~18% 2.0%~7.8%

9.5%

8.9%

2.4 $\mu\text{g/L}$ 14 $\mu\text{g/L}$

3.1 μ / q ·

7

10.2

6

1.00 µg/L 5.00 µg/L

88.5%~122% 76.2%~99.1%

103%±25.2% 90.8%±19.0%

6

1.00 µg/L 5.00 µg/L

90.7%~107% 91.4%~105%

97.2%±14.0% 96.6%±10.4%

6

10.0 µg/L 100 µg/L

79.2%~104% 78.9%~104%

96.8%±18.2%

95.2%±17.0%

11

11.1

5

0.995

RRF

20%

24 h

20%

11.2

20 /

11.3

20 /

5%

20

30%

:

11.4

20 /

1

70.0%~130%

12

13

13.1

CS₂

13.2

13.3

1+1

13.4

70%

25g/L