

KES

Quantitative Analysis of Grade
for NBR Rubber Products

KES T – M086

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Additional Rules



1. Scope of application

This standard shall specify the method of quantitative grade analysis of NBR rubber products. The standard is grade analysis method of DN101, 1000 × 132, DN508, KNB35L, NV-72, N23DSL, DN507, 41080 and NBR + PVC.

2. Summary of method

After removing damping material, adding material, and metal component, make chromatogram and analyze by heat decomposing method of gas chromatography by extracting.

3. Equipment

- (1) Extracting equipment: use extracting equipment of KES B-L019 (Natural rubber analysis method).
- (2) Gas chromatography
- (3) Recorder

4. Gas chromatography condition

4.1 Column

- (1) Size : 2 m × 3 mmφ
- (2) Temperature : 50 °C ~ 220 °C
- (3) Temperature increasing rate : 15 °C / minute
- (4) Packing material : PEG 20 m
- (5) Packing material wt % : 10
- (6) Support : Sahimatite
- (7) Mesh : 60 ~ 80

4.2 Test material content : 0.52 mg

4.3 Carrier gas

(1) Gas : He

(2) Flow rate : 50 50 mL / min

(3) Hr flow rate : 0.6 kg / cm²

(4) Air flow rate : 0.5 kg / cm²

4.4 Detector

(1) Type : FID

(2) Temperature : 230 °C

4.5 Range : 1000

4.6 Attenuation : 5

4.7 Injection temperature : 230 °C

4.8 Chart speed : 5 mm / minute

4.9 Heat decomposition temperature : 590 °C

5. Operation

- (1) Take appropriate quantity of test material and cut to extract
- (2) Put the test material into extraction equipment, extract it by acetone-chloroform extraction method of KES B-L019 (Component analysis method of natural rubber), and put resin into heat decomposition equipment of gas chromatography.
- (3) Make chromatogram from gas chromatography established at clause 4.

6. Result

- (1) After calculating density according to primary peak time by table 1 from chromatogram made by clause 5, compare it with table 1 or with from figure1 to figure 9.
- (2) After finding the grade to describe similar figure or density, report it according to grade name.

Table1 Density according to peak time

Unit : wt %

Unit: wt %

Grade Peak Time (Min.)	DN101	1000 × 132	DN508	KNB35L	NV-72	N230 SL	DN507	41080	NBR+ PVC
0.67 ± 0.03	-	-	23.9	-	-	-	-	-	-
0.78 ± 0.03	24.2	26.9	-	31.0	27.1	31.3	24.9	27.6	27.9
1.68 ± 0.03	3.1	0.4	-	4.3	3.8	-	3.1	0.5	3.2
2.48 ± 0.03	2.7	2.4	6.8	3.4	5.9	3.9	5.8	2.7	2.3
2.83 ± 0.03	-	-	6.2	6.1	-	-	-	8.2	-
3.03 ± 0.03	8.8	16.0	-	-	-	15.1	-	-	14.8
3.28 ± 0.03	5.3	-	6.0	5.7	12.1	-	11.4	5.2	-
3.93 ± 0.03	1.4	1.5	1.0	1.4	1.1	2.0	-	-	1.3
7.23 ± 0.03	2.3	2.0	2.1	1.7	-	-	2.3	-	2.2
8.04 ± 0.03	2.4	2.3	2.7	2.4	-	2.9	-	2.3	2.1
8.56 ± 0.03	1.4	1.6	1.1	1.2	-	1.7	-	1.5	1.5
8.93 ± 0.03	3.6	3.4	3.3	3.1	5.1	3.4	5.1	3.4	2.8
10.06 ± 0.03	2.3	2.4	3.1	1.8	3.1	2.0	3.1	2.0	1.8
11.23 ± 0.03	2.1	2.0	2.2	1.5	1.9	1.8	3.2	2.2	2.5
11.75 ± 0.03	2.6	1.9	1.4	2.1	4.4	2.1	4.9	2.5	1.6
12.21 ± 0.03	1.7	2.7	2.2	1.8	-	1.9	-	1.7	2.7

* The density of this table is not accurate but approximate value.

DN101

START 01.13.14.03.

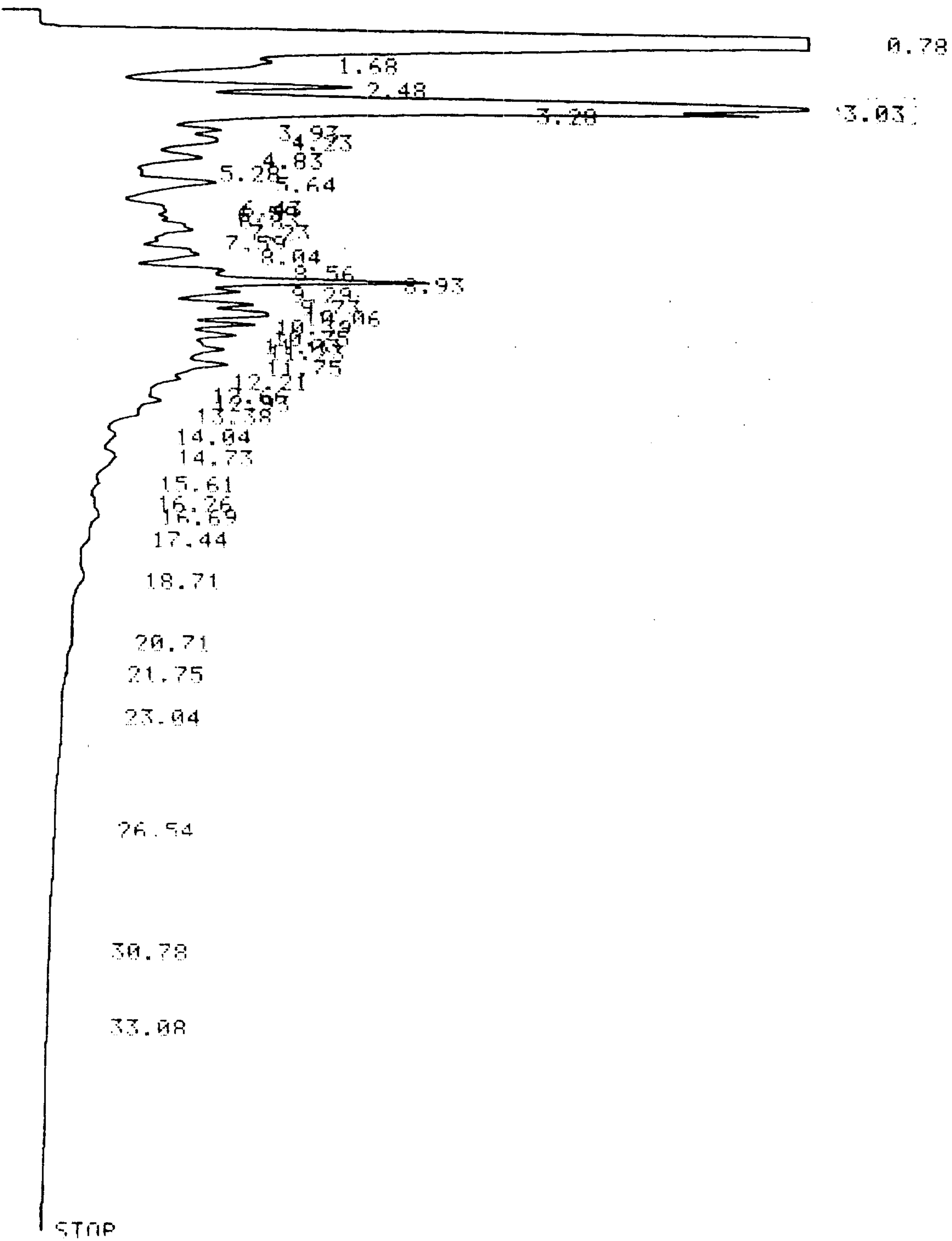


Figure 1 DN101 grade