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<p>(21) International Application Number: PCT/IT00/00175 (22) International Filing Date: 5 May 2000 (05.05.00) (30) Priority Data: RM99A000286 7 May 1999 (07.05.99) IT (71) Applicant (for all designated States except US): CHIMEC S.p.A. [IT/IT]; Via delle Ande, 19, I-00144 Roma (IT). (72) Inventors; and (75) Inventors/Applicants (for US only): ZANOTTI, Andrea [IT/IT]; Via delle Fresie, 7, I-00042 Anzio (IT). BUCCOLINI, Marco [IT/IT]; Via Muralto, 11, I-62032 Camerino (IT). MASCIOLA, Roberto [IT/IT]; Via Ramiro Fabiani, 100, I-00158 Roma (IT). (74) Agents: BAZZICHELLI, Alfredo et al.; Società Italiana Brevetti S.p.A., Piazza di Pietra, 39, I-00186 Roma (IT).</p>		<p>(81) Designated States: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> <i>In English translation (filed in Italian). Without international search report and to be republished upon receipt of that report.</i></p>
<p>(54) Title: GASOLINE STABILIZING COMPOSITION FOR PREVENTING GUM FORMATION</p>		
<p>(57) Abstract</p> <p>Gasoline stabilizing composition for inhibiting the degradation with gum formation of said gasoline, comprising as effective ingredients towards said inhibition phenothiazine (PNTZ) and tert.butyl-catechol (TBC) in a ratio of 5:95 to 80:20 therebetween.</p>		

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- 1 -

GASOLINE STABILIZING COMPOSITION FOR PREVENTING GUM  
FORMATIONDESCRIPTIONBackground of the Invention

5           The present invention relates to the stabilization  
of gasoline for preventing gum formation, specifically it  
relates to gasolines obtained by steam cracking. However,  
the stabilizing composition according to the invention is  
also effective in the stabilization of gasolines  
10           outputted from thermal (e.g., Visbreaking, coking and the  
like), or catalytic (e.g. Fluidized Catalytic Cracking)  
cracking plants.

          The stabilization according to the invention is  
obtained by use of a composition comprising phenothiazine  
15           (PNTZ) and tert.butyl catechol, unexpectedly providing,  
at certain use ratios, a synergistic stabilizing effect.

          The term «gasolines» refers to the fuels for the  
normal internal combustion engines, made of blends of  
hydrocarbons that may widely differ one from the other  
20           according to the production process thereof.

Background of the prior art

          As it is well-known, all gasolines are subject,  
especially upon storage, to degradation phenomena leading  
to the formation of gum-like polymeric substances,  
25           producing sticky deposits. These substances are known to  
cause severe clogging and sticking problems to the  
filters, the valves and the transfer pumps, besides  
adversely effecting the combustion performance of the  
gasoline itself.

30           Among the various gasolines, the stability issue is  
particularly critical for those gasolines outputted from  
cracking plants, containing, in fact, a relatively high  
amount of hydrocarbons having double bonds readily  
polymerizable in presence of free radicals (unsaturated  
35           hydrocarbons).

          The stability problem is particularly critical for  
gasolines produced by a steam cracking process. However,

-2-

the problem concerns any thermal (visbreaking, coking, thermal cracking), as well as catalytic (FCC, LC finer, Mild Hydrocracking, HDS) cracked gasoline.

5 In the present context, the stability is evaluated as resistance to degradation caused by oxygen contact.

In the prior art, in order to eliminate or reduce the incidence of the above-mentioned problems, stabilizers added to the gasoline for enhancing the stability thereof were used.

10 Effective stabilizers for gasolines of the prior art belong to the class of the aromatic amines. For instance, paraphenylenediamines (PDA), that can also be used in admixture with other materials, like, e.g., the nitroxides (US-A-5,711,767) or the hindered phenols (US-  
15 A-5,509,944).

Other examples thereof are the N-substituted p-aminophenols (US-A-2,305,676 and 2,333,204), the polyamines and the hydroxylamines (US-A-4,648,885).

20 Even though their effectiveness is indisputable, their use is clearly unadvisable due to the hazardousness thereof, as highlighted by the actual toxicological knowledge.

In fact, due to their carcinogenicity confirmed by testing on animals and corroboration on human beings,  
25 several substances belonging to this class have been disallowed, as reported by various International organizations (EPA, CEE and others), that tend to consider every aromatic amine as a potential carcinogen.

30 The use of phenothiazine, alone or in admixture with other materials, is known to stabilize monomers and as an antifouling agent in oil or petrochemical processes, and overall as a polymerization inhibitor of vinyl aromatic compounds (US-A-4,061,545).

35 The use as stabilizers of spontaneously polymerizing monomers of phenols, and in particular of TBC, has been long-time known, for various monomers marketed as reactants or for industrial use (styrene, butadiene and

- 3 -

the like).

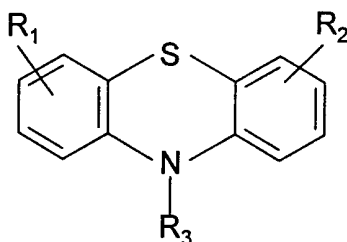
Moreover, the TBC is used in many stabilizing-antifouling agent combinations when an inhibition of polymerization reactions is required, (US-A-3 553 990), and as a retarding agent in the formation of coke and of fouling in petrochemical processes.

#### Description of the Invention

Therefore, it is an object of the present invention to provide a gasoline stabilizing composition, and the use thereof as such, having an effectiveness equal to or greater than that of the aromatic amines, yet being void of the toxicity hazards associated to the latter.

The stabilizer of the present invention is a blend, comprising in a certain weight ratio:

A) substituted or unsubstituted phenothiazine (PNTZ) of formula

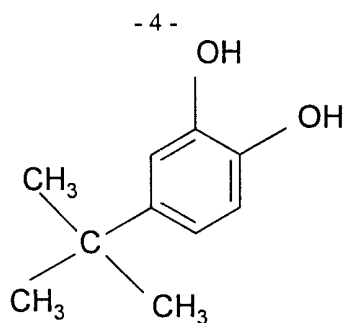


formula (1)

wherein  $R_1$  and  $R_2$  represent H, an alkyl  $C_1 - C_{20}$  or a cycloalkyl  $C_5 - C_{20}$  group and  $R_3$  represents H, an alkyl  $C_1 - C_{20}$  or cycloalkyl  $C_5 - C_{20}$  and phenyl group, said alkyl and cycloalkyl groups possibly also containing functional groups,

or dimer phenothiazine; and

B) 4-tert.butyl-catechol (TBC) of formula

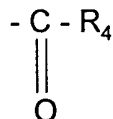


formula (2)

As functional groups possibly contained in the substituted PNTZ of formula (1), there could be, e.g.:

ester or carboxylic acid groups and derivatives thereof, of the type

5

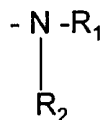


wherein  $\text{R}_4$  is H, OH,  $\text{R}_3$ ,  $-\text{OR}_1$ , or  $-\text{OR}_3$ ;

alcohol or ester groups of the  $-\text{O}-\text{R}_3$  type;

amino groups of the type

10



or mercaptane or sulfur groups of the  $-\text{S}-\text{R}_1$  type.

A novel solution to the problem of gasolines stabilization and prevention of gum formation is provided by the use of a composition of PNTZ and of TBC in a suitably balanced ratio therebetween, having low toxicity and high effectiveness, equal to or higher than that of the PDA, and void of carcinogenic hazards, in the stabilization of pyrolysis gasolines, particularly of

15

- 5 -

catalytic cracking gasolines.

Therefore, the subject-matter of the present invention is a gasoline stabilizing composition for preventing the gum formation and the degradation thereof, characterized in that it comprises, as effective preventing components, substituted or unsubstituted phenothiazine (PNTZ) or dimer, and tert.butyl-catechol (TBC) in a certain ratio therebetween, as well as the use thereof as a stabilizer, the gasolines thus stabilized and the related gasoline stabilization method.

According to the present invention, the gasoline stabilization is carried out by adding to the gasoline 5 to 1000 ppm of a stabilizer, comprising as active stabilizing ingredients PNTZ and TBC in a weight ratio therebetween of 5:95 to 80:20, preferably of 27:75 to 40:60, even more preferably of 30:70 to 35:65, with an optimum value of about 33.3:66.6.

The dosage of the additive with respect to the gasoline, as well as the ratio of the two compounds, can vary with particular reference to the Bromine number and to the diene value.

The composition according to the invention may contain, besides the two above-mentioned components, PTNZ and TBC, other PTNZ- and TBC- compatible components and additive carriers commonly used in stabilizing compositions. Particularly suitable solvents are the aromatic solvents, like benzene, toluol and the like, as well as dimethyl-formamide and dimethyl-acetamide.

The combined use of the compounds in the blend yields a synergistic effect that is particularly significant at the preferred weight ratio values of the compounds.

#### EMBODIMENTS

The effectiveness of the stabilizing blend according to the invention was measured in tests that will hereinafter be disclosed.

Stability measurement tests use an assay for

-6-

measuring the stability to degradation of the gasolines denominated Induction Period (Time?) Method ASTM D525. This method is deemed the most suitable for measuring the stability of the gasolines, by virtue of the predictive capacity thereof of the gum formation due to a gasoline polymerization in presence of oxygen.

Such method provides the heating at 100°C (98°C-102°C) of a 50 ml sample in a bomb, sealed and subjected to a 690 kPa (100 psi) air pressure.

The test attains a break point, represented by the instant when, on the pressure gauging curve, first a pressure drop of at least 14 kPa (2 psi) over 15 minutes, and then, over the next 15 minutes, another drop of at least 14 kPa (2 psi) take place.

The induction time is determined by the time elapsed from the test start (positioning of the bomb inside the heating bath) to the break point.

Apparently, the induction time is a direct expression of the gasoline liability to gum formation during storage. This evaluation parameter is highly significant for highly unstable gasolines, like the cracked ones.

#### EXAMPLE 1.

Effectiveness of the TBC (tert.butyl-catechol) + PNTZ (phenothiazine) blend with respect to the stabilizers of the prior art.

The induction time for a series of stabilizers used in the art, including that of TBC and PNTZ, each individually, and that of TBC+PNTZ blends in different ratios, is measured for comparison on a cracked gasoline (Gasoline 1, Bromine number 65, diene value 7). The results are reported in the following Table 1.

-7-

TABLE 1

PRODUCT SAMPLE	DOSAGE (ppm)	INDUCTION TIME (min)
Blank		60
Irganox 1010	300	180
2,6-DTB-phenol	300	195
PDA	150	330
TBC	150	300
2,4-DM-6-TB-phenol	150	180
PNTZ	150	190
TBC+PNTZ	75+75	360
TBC+PNTZ	100+50	400
TBC+PNTZ	50+100	330

The table shows the predictable result that, when used individually, the best products are the PDA and the TBC, in accordance to long-time refinery practice. However, surprisingly, the blend TBC+PNTZ according to the invention emerges as a stabilizer having an effectiveness even greater than that of the PDA, therefore being capable of replacing the latter with improvement of performance, as well as toxicity elimination.

EXAMPLE 2.

A test series was carried out in order to assess the optimal ratio between the two components of the TBC+PNTZ blend, on the basis of the induction time method. The results are reported in the following Table 2.

TABLE 2

PHENOTHIAZINE (ppm)	TBC (ppm)	INDUCTION TIME (min)
0	150	300
75	75	360
150	0	190
37.5	112.5	375
50	100	400
60	90	390

20

Tests results, reported on a curve, show that the best stabilization is provided by a weight ratio of about

- 8 -

2:1 between the two components TBC and PNTZ (TBC 66.66% and phenothiazine 33.33%) with a <400 min induction time value.

EXAMPLE 3.

5 The effectiveness of a 1:2 PNTZ+TBC blend is directly compared to that of the PDA, always with reference to the induction time, for a cracked gasoline (Gasoline 2, Bromine number 62, diene value 8). The results are reported in the following Table 3.

10

TABLE 3

STABILIZER	DOSAGE (ppm)	Induction Time (min)
Blank		60
PDA	75	225
PNTZ+TBC	50	240
PDA	100	255
PNTZ+TBC	100	300
PDA	125	300
PNTZ+TBC	150	405
PDA	175	315
PNTZ+TBC	200	435
PDA	200	315

15 As it is apparent from the results reported in Table 3, the dosage (quantity in ppm) of the additive according to the invention and of the PDA, the stabilizing effectiveness (induction time) is significantly higher for the blend of the present invention, and this under extremely less critical operative conditions.

20

EXAMPLE 4

25 The partial PDA replacement with tert.butyl phenols (TBP) was advanced in the prior art, in order to reduce the environmental risks. Table 4 shows some results obtained on two types of cracked gasolines of the prior art, in which the addition of the above-mentioned

- 9 -

tert.butyl-phenols (TBP) appears to be substantially effective, since, in the PDA replacement, the effectiveness of the former proves to be substantially equal to the PDA one. Therefore, the advantage of the TBPs is that of approximately obtaining the same effects of the PDA, yet with a 50% decrease of the latter, and with the entailed reduction of the toxicity hazards.

The results are reported in the following Table 4.

10

TABLE 4

STABILIZER	Dosage (ppm)	PDA content (ppm)	Induction Time (min)
Gasoline 3 Br. N° 40 diene value 2	-	-	45
PDA/TBP 1:1	200	100	435
PDA	200	200	435
PDA/TBP 1:1	500	250	720
PDA	500	500	735
Gasoline 4 Br n° 62 diene value 8	-	-	45
PDA/TBP 1:1	300	150	400
PDA	300	300	400
PDA	200	200	360
PDA	100	100	240

15

The above-reported results are compared to those of the following Table 5, wherein the induction time values measured under the same conditions of Table 4 are compared to the induction time values obtained by the additive of the present invention, for the stabilizing effectiveness of the same gasoline type and for different gasolines.

20

Gasoline 5: Br N° 56 diene value 4

- 10 -

Gasoline 6: Br N° 58 diene value 5  
 Gasoline 7: Br N° 40 diene value 3  
 Gasoline 8: Br N° 62 diene value 9

TABLE 5

Gasoline Sample	STABILIZER	INDUCTION TIME (min)
Gasoline 5	PDA/TBP 1:1 (90 ppm)	180
	PNTZ/TBC (30 ppm)	150
	PDA/TBP 1:1 (180 ppm)	315
	PNTZ/TBC (60 ppm)	285
Gasoline 6	PDA/TBP 1:1 (180 ppm)	300
	PNTZ/TBC (60 ppm)	300
	PDA/TBP 1:1 (270 ppm)	435
	PNTZ/TBC (90 ppm)	435
Gasoline 7	PDA/TBP 1:1 (90 ppm)	165
	PNTZ/TBC (30 ppm)	165
	PDA/TBP 1:1 (235 ppm)	375
	PNTZ/TBC (75 ppm)	360
Gasoline 8	PDA/TBP 1:1 (270 ppm)	375
	PNTZ/TBC (30 ppm)	375
	PDA/TBP 1:1 (360 ppm)	420
	PNTZ/TBC (120 ppm)	420

5 The test results reported in Table 5 should be compared to those of Table 4. They refer to tests carried out in order to simulate a wide range of cracked products, with gasoline characteristics, like, e.g. the Bromine number and the diene value, differing thereamong.

10 This tests prove that the blend PNTZ/TBC of the present invention can replace, even with a higher effectiveness, the PDA+TBP blends, completely avoiding any toxicity

- 11 -

hazard deriving from the use of the aromatic amines.

As in the above, the induction time test is applied also in the following examples 5-9, in which the effectiveness of the additive according to the invention (PNTZ-TBC in a 1:2 ratio) is compared to that of other stabilizers of the known art. The test is carried out on gasolines outputted by various industrial FCC (Fluid Catalytic Cracking) plants located in various European countries.

EXAMPLE 5

The first gasoline sample is made of 26% C5 hydrocarbon cut, 60% light gasoline and 14% medium gasoline.

Cut characteristics:

	Light gasoline	Medium gasoline
Density	0.680	0.780
P.I.	35°C	71°C
50% vol.	56°C	143°C
95% vol.	110°C	195°C
P.F.	139°C	213°C
Br N°	92 gr./100 cc	40 gr./100 cc
Sulfur	120 ppm	630 ppm
Olefins	44% p	27.4% p
Paraffins	46.9% p	34.3% p
Naphtens	5.4% p	13.5% p
Aromatics	3.7% p	24.7% p

Blank Induction Time: 75 min.

Dosage	PNTZ + TBC (1:2)	TBC + 2,6 DTB Phenol (1:4)	PDA + 2,6 DTB Phenol (1:1)
3 ppm	315'		
6 ppm		225'	
7.5 ppm	480'		
9 ppm			495'
15 ppm	570'	240'	
30 ppm		300'	
45 ppm		480'	

EXAMPLE 6.

The second gasoline sample has the following  
5 characteristics.

Cut characteristics:

Density	0.678
P.I.	32°C
50% vol.	54°C
10 95% vol.	106°C
P.F.	124°C
Br N°	91.5 gr./100 cc
Sulfur	96 ppm
Olefins	32.5% p
15 Paraffins	58.5% p
Naphtenes	6.1% p
Aromatics	2.9% p

Blank Induction Time: 75 min.

Dosage	PNTZ + TBC (1:2)	TBC + 2,6 DTB Phenol (1:4)	PDA + 2,6 DTB Phenol (1:1)	2,6 DTB Phenol + 2,4 DM 6, TB Phenol (7:1)
7.5 ppm	400'			
15 ppm	630'	325'		
20 ppm			340'	285'
30 ppm		415'		
40 ppm				360'
45 ppm			555'	

EXAMPLE 7.

The third sample has the following characteristics.

5	Cut characteristics:	
	Density	0.7217
	P.I.	35°C
	5% vol.	45°C
	10% vol.	50°C
10	30% vol.	62°C
	50% vol.	79°C
	90% vol.	140°C
	95% vol.	150°C
	P.F.	165°C
15	Sulfur	0.08% p

Blank Induction Time: 188 min.

Dosage	PNTZ + TBC (1:2)	PDA + 2,6 DTB Phenol (1:1)
3 ppm	225'	
7.5 ppm	>520'	
9 ppm		207'
22.5 ppm		>520'

EXAMPLE 8.

The fourth sample is a light gasoline having the following characteristics.

Cut characteristics:

Density	0.6638
P.I.	30°C
5% vol.	36°C
50% vol.	51°C
95% vol.	95°C
P.F.	144°C

Blank Induction Time: 180 min.

Dosage	PNTZ + TBC (1:2)	PDA + 2,6 DTB Phenol (1:1)
15 ppm	870'	
45 ppm		555'

EXAMPLE 9.

The fifth sample is a medium gasoline having the following characteristics.

Cut characteristics:

Density	0.7582
P.I.	87°C
5% vol.	97°C

- 15 -

50% vol. 110°C  
 95% vol. 139°C  
 P.F. 147°C

5 Blank Induction Time: 90 min.

Dosage	PNTZ + TBC (1:2)	PDA + 2,6 DTB Phenol (1:1)
15 ppm	400'	
45 ppm		285'

EXAMPLE 10.

10 Another test battery was carried out using a different ASTM test method, always related to the gasoline stability, carried out on a gasoline sample additioned with 100 ppm stabilizer, stored at 40°C for 43 days in a blanketed flask.

15 The so-called existent gums, i.e. the quantity of polymers formed (in mg/100 ml gasoline) following a brisk evaporation of a gasoline quantity in a preheated air jet at 160-165 °C, are determined through the ASTM D381/94 method, entitled «Standard test method for existent gum in fuels by Jet Evaporation».

20 Carrying out the same method on specimens of the gasoline stored at 40°C, additioned and not, at T=0 and at day 8, 22, 29 and 43 an increasing trend of said quantity of formed polymers (gums) is observed, which evidently is inversely proportional to the stabilizing effectiveness of the added additive.

25 In fact, the effectiveness of the product is inversely proportional to the quantity of gums to be found. This difference in the effectiveness is already apparent at T=0, i.e., when the ASTM D381 test is carried  
 30 out right after the additioning, because the additive prevents the gum formation during the hot evaporation

provided by the method itself. However, the significance of such difference of effectiveness increases over time. In fact, the additive prevents the gum formation during the storage at 40°C.

5           The results in mg/100 ml of a cracked gasoline sample are the following:

	days	0	8	22	29	43
Blank		834	746	804	1595	3891
10 PDA	100 ppm	717	536	561	862	2639
PNTZ + TBC (3:2)	100 ppm	698	469	555	722	2525

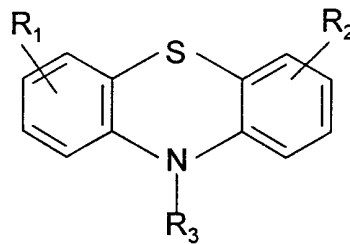
15           The above-reported result, obtained during and after the 43-day period, evidences a higher effectiveness of the PNTZ-TBC blend with respect to the aromatic amine, associated to an absence of toxicity, by virtue of the absence of the aromatic amines.

- 17 -

CLAIMS

1. Gasoline stabilizing composition for inhibiting the degradation of said gasoline by preventing gum formation, characterized in that it comprises as effective inhibition ingredients:

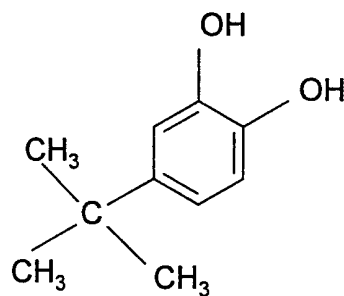
5 A) substituted or unsubstituted phenothiazine (PNTZ) of formula



formula (1)

10 wherein  $R_1$  and  $R_2$  represent H, alkyl  $C_1-C_{20}$  and cycloalkyl  $C_5-C_{20}$  groups and  $R_3$  represents H, alkyl  $C_1-C_{20}$  and cycloalkyl  $C_5 - C_{20}$  or phenyl groups, said alkyl and cycloalkyl groups possibly containing functional groups, or dimer phenothiazine and

15 B) tert.butyl-catechol (TBC) of formula



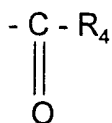
formula (2)

in a ratio of 5:95 to 80:20 therebetween.

2. The composition according to claim 1, wherein said functional groups are selected from the class comprising:

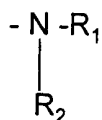
20 ester or carboxylic acid groups and derivatives thereof, of the type

- 18 -



wherein  $R_4$  is H, OH,  $R_3$ ,  $-OR_1$ , or  $-OR_3$ ;  
 alcohol or ester groups of the  $-O-R_3$  type;  
 amino groups of the type

5



or mercaptane or sulfur groups of the  $-S-R_1$  type.

3. The composition according to claim 1 or 2,  
 wherein said ratio is 27:75 to 40:60.

10 4. The composition according to any one of the  
 preceding claims, wherein said ratio is 30:70 to 35:65.

5. The composition according to any one of the  
 preceding claims, wherein said gasoline is a gasoline  
 produced by a cracking process.

15 6. The composition according to claim 5, wherein  
 said cracking process is a steam cracking process.

7. The composition according to claim 5, wherein  
 said cracking process is a thermal cracking process.

20 8. The composition according to claim 5, wherein  
 said cracking process is a catalytic cracking process.

9. The composition according to any one of the  
 preceding claims, further comprising usual PNTZ- and TBC-  
 compatible carriers.

25 10. The use of a gasoline stabilizing composition  
 according to any one of the claims 1 to 9, for inhibiting  
 the degradation of said gasoline with gum formation.

11. The use of a stabilizing composition according  
 to claim 10, wherein the ratio between phenothiazine and

- 19 -

tert.butyl-catechol is 5:95 to 80:20.

12. The use of a stabilizing composition according to claim 11, wherein said ratio is 27:75 to 40:60

13. The use of a stabilizing composition according to claim 12, wherein said ratio is 30:70 to 35:65.

14. The use of a stabilizing composition according to any one of the claims 10 to 13, wherein said gasoline is a gasoline produced by a cracking process.

15. The use of a stabilizing composition according to claim 14, wherein said cracking process is a steam cracking process.

16. The use of a stabilizing composition according to claim 14, wherein said cracking process is a thermal cracking process.

17. The use of a stabilizing composition according to claim 14, wherein said cracking process is a catalytic cracking process.

18. The use of a stabilizing composition according to any one of the claims 10 to 17, further comprising usual PNTZ- and TBC-compatible additives and carriers.

19. The gasoline stabilized by the addition of an effective quantity towards the inhibition of the degradation of said gasoline with gum formation, of a stabilizing composition according to any one of the claims 1 to 9.

20. The stabilized gasoline according to claim 19, wherein said gasoline is a gasoline produced by a cracking process.

21. The stabilized gasoline according to claim 20, wherein said cracking process is a steam cracking process.

22. The stabilized gasoline according to claim 20, wherein said cracking process is a thermal cracking process.

23. The stabilized gasoline according to claim 20, wherein said cracking process is a catalytic cracking process.

- 20 -

24. The stabilized gasoline according to claim 20, wherein said effective composition quantity is 5 to 1000 ppm.

5 25. A method for stabilizing a gasoline by inhibiting the degradation of said gasoline with gum formation, comprising the step of adding to said gasoline an effective quantity therefor, of a stabilizing composition according to any one of the claims 1 to 9.

10 26. The method for stabilizing a gasoline wherein said effective composition quantity is 5 to 1000 ppm.