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COLOR STABILIZATION OF BRIGHT STOCK

4 Claims. (Cl. 252—50)

Mixtures of tertiary alkyl primary amines of the above

Table I

60		1	2	3	4
	150 MC Bright Stock S-P 10 Pour.....	100.0	99.9	99.9	99.9
	Normal alkyl group C ₁₆₋₁₈ amine.....		0.1		
	Tertiary alkyl group C ₁₈₋₂₄ amine.....			0.1	
	Tertiary alkyl group C ₁₂₋₁₅ amine.....				0.1
65	Inspection:				
	Color, ASTM Union.....	6.0	6.0	6.0	6.0
	Stability Test—With Copper				
	Strip, 100°F., Hr. to 7.0				
	ASTM Union Color.....	96	624	720	720

70 Table I is a comparison between the branched chain amines representing our invention and the most active of other color stabilizing amines which we have tested. The relative activity of various amines was evaluated in a

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series of tests the same as those described above except that an oven temperature of 230° F. was used. The data on these tests are given in Tables II and III.

Table II

	1	2	3
150 MC Bright Stock S-P 10 Pour	100.0	99.9	99.9
Normal alkyl group C ₁₆₋₁₈ amine		0.1	
Normal alkyl group C ₆₋₁₀ amine			0.1
Inspection:			
Color, ASTM Union	5.5	5.5	5.5
Stability Test—With Copper Strip, 230° F., Hr. to 8.0 ASTM Union Color	128	168	144

¹ Extrapolated.

Table III

	1	2	3	4	5	6	7	8
150 MC Bright Stock S-P 10 Pour	100.0	99.95	99.95	99.95	99.95	99.95	99.95	99.95
Aminoethyl ethanolamine		0.05						
Normal alkyl group C ₁₆₋₁₈ amine			0.05					
Methylbenzylmonoethanolamine				0.05				
Cyclohexylamine					0.05			
Dibutylethanolamine						0.05		
Dicyclohexylamine							0.05	
Di-N-butylamine								0.05
Inspection:								
Color, ASTM Union	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Stability Test—With Copper Strip, 230° F., Color, ASTM Union After 96 Hr	18+	8.0	7.0	7.5	7.5	7.5	7.5	7.5

¹ Extrapolated (actual color of 8.0 after 72 hours at 210° F.).

² Extrapolated.

The normal alkyl group C₁₆₋₁₈ amine shown in Table II was identical to the amine tested in column 2 of Table I. The normal alkyl group C₆₋₁₀ amine mentioned in Table II was a mixture of amines constituting 90 percent normal octyl, 7 percent normal decyl and 3 percent normal hexyl primary amine. It was a commercial mixture ("Armeen 8" manufactured by Armour and Company) having a mean molecular weight of 129 and an approximate melting point of 8.6° F. The "normal alkyl group C₁₆₋₁₈ amine" in Table III was a commercial mixture ("Armeen 16" manufactured by Armour and Company) containing 90 percent normal hexadecyl amine, 6 percent normal octadecyl amine and 4 percent normal octadecenyl amine. It had a mean molecular weight of 244 and an approximate melting point of 100° F.

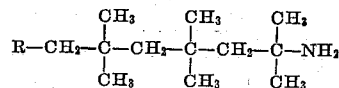
The foregoing data establish that the samples containing the stabilizer of the type described herein had substantially higher stabilizing power than primary unbranched aliphatic amines. The above data also establish that primary unbranched amines are superior to the other types of amines.

What we claim is:

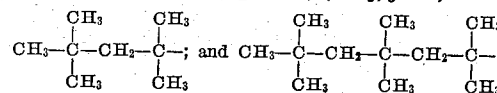
1. A color stabilized bright stock containing between approximately .01 and 0.1 percent by weight of an amine having the formula R—NH₂ in which R is a tertiary alkyl group containing 12 to 24 carbon atoms which is attached to the amino group by the tertiary carbon atom.

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2. A color stabilized bright stock containing between approximately .01 and 0.1 percent by weight of an amine having the formula:



wherein R is a member of the group consisting of: H—; CH₃—; CH₃CH₂—; (CH₃)₂CH—; (CH₃)₃C—;



3. A color stabilized bright stock containing between

approximately .01 and 0.1 percent by weight of a mixture of amines having the formula R—NH₂ in which R is a tertiary alkyl group containing 12 to 15 carbon atoms having a molecular weight of 185–227, a specific gravity of .835, a neutralization equivalent of 208 and a flash point of 210° F., said tertiary alkyl group being attached to the amino group by the tertiary carbon atom.

4. A color stabilized bright stock containing between approximately .01 and 0.1 percent by weight of a mixture of amines having the formula R—NH₂ in which R is a tertiary alkyl group containing 18 to 24 carbon atoms, having an average molecular weight of about 269, a specific gravity of about .85, a neutralization equivalent of about 349 and a flash point of about 269° F., said tertiary alkyl group being attached to the amino group by the tertiary carbon atom.

References Cited in the file of this patent

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OTHER REFERENCES

"Tertiary-Alkyl Primary Amines"; Rohm and Haas, Phila., Pa.; Sept. 1954, page 3.