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2,709,130

BLASTING EXPLOSIVES

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1 Claim. (Cl. 52—11)

This invention relates to blasting explosives of the type designated as dynamites, manufactured with compositions containing mixtures of trimethylolethane trinitrate and 2,2-dimethyl-1,3-propanediol dinitrate.

In the manufacture of dynamites it has been customary to employ nitroglycerin with or without the addition of nitropolyglycerin, nitrated sugars, ethyleneglycol dinitrate or similar explosive substances soluble in nitroglycerin and suitable for lowering the freezing point of nitroglycerin. Added to nitroglycerin or such mixtures have been explosive and nonexplosive ingredients such as nitrocellulose, ammonium nitrate, sodium nitrate, carbonaceous fuels, sulphur, and calcium carbonate. However, nitroglycerin has an undesirably high freezing point (13.2° C.), and the above mixtures of nitroglycerin and explosive solutes have been found to have undesirable properties with respect to freezing point, sensitivity, viscosity and stability.

It has been found that mixtures of trimethylolethane trinitrate



and 2,2-dimethyl-1,3-propanediol dinitrate



have lower freezing points, are much less sensitive to shock, are distinctly more viscous, and are markedly more stable than corresponding mixtures of nitroglycerin and solutes such as ethylene glycol dinitrate. Such mixtures of trimethylolethane trinitrate and dimethylpropanediol dinitrate have been found to possess some or all of these points of superiority when compared with mixtures of nitroglycerin and nitropolyglycerin, nitrated sugars, etc.

The nitration of trimethylolethane (methyl-trimethylol-methane) to form the trinitrate has been described in German Patent 474,173 to Von Herz. Dimethylol-dimethyl-methane dinitrate has been described in U. S. Patent 1,883,045 issued to Spaeth.

The particular mixture of trimethylolethane trinitrate and dimethylpropanediol dinitrate that I may use in a dynamite composition depends upon the other ingredients to be used and the extent to which the freezing point of

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the trimethylolethane trinitrate (—3° C.) is to be lowered. If the dynamite is to include no nitrocellulose or similar colloidal explosive, the proportions of the two nitrates are determined by the desired freezing point, viscosity and sensitivity characteristics. If the dynamite is to include nitrocellulose or similar colloidal explosive, a relatively high proportion of dimethylpropanediol dinitrate to trimethylolethane trinitrate may be desirable to insure complete gelatinization. The mixtures therefore may contain 50 to 85 per cent trimethylolethane trinitrate and 15 to 50 per cent dimethylpropanediol dinitrate. Such mixtures may be prepared by simple mixing of the two liquid nitrates in the desired proportions or by nitrating mixtures of trimethylolethane and dimethylpropanediol.

As examples of preferred compositions containing mixtures of trimethylolethane trinitrate and dimethylpropanediol dinitrate, the following are mentioned:

	1	2	3	4	5	6	7
Trimethylolethane trinitrate, Percent.....	46	30	25	10	30	10	10
Dimethylpropanediol dinitrate, Percent.....	45	9	5	9	9	4	4
Nitrocellulose or nitrostarch, Percent.....	8	1	1/2				
Sodium nitrate, Percent.....		50	45	25	45	5	
Ammonium nitrate, Percent.....			15	45	15	75	80
Carbonaceous matter, Percent.....		8	7	8		5	5
Sulphur, Percent.....		1	2	2			
Antacid, Percent.....	1	1	1/2	1	1	1	1

In these compositions I may use as preferred such antacids as calcium carbonate, zinc oxide, or magnesium carbonate or mixtures of two or more of these. It is to be noted that my claim of invention is not restricted to compositions containing only the ingredients shown in the above examples, as I may use substitutes for some of these and add other ingredients such as TNT, liquid nitrotoluenes, sodium chloride, ammonium chloride, alum, ammonium sulphate, or gypsum.

I claim:

A blasting explosive comprising a mixture of trimethylolethane trinitrate and 2,2-dimethyl-1,3-propanediol dinitrate in the proportions of 50 to 85 parts by weight of trimethylolethane trinitrate and 15 to 50 parts by weight of 2,2-dimethyl-1,3-propanediol dinitrate for 100 parts of the said trinitrate and dinitrate.

References Cited in the file of this patent

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