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PROCESS FOR THE MANUFACTURE OF EXPLOSIVE MATERIALS

Walter Friederich, Troisdorf, Germany

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3 Claims. (Cl. 260—142)

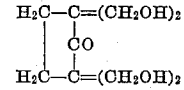
The nitrates of pentaerythrite and of anhydro-enneaheptite have been proposed for the use for very different purposes, as per example for the manufacture of detonating caps, detonating fuses, artillery explosive shells and explosive charges of any kind. The pentaerythrite-tetranitrate also has been used in manufacturing smokeless gunpowders, as well as for numerous other purposes, as per example for charging of blasting caps, of detonating fuses and preparation of different explosive charges.

I now have ascertained that the cyclic ketone alcohols, tetramethylolcyclopentanone, tetramethylolcyclohexanone, as well as their reduction products, the cyclic alcohols, tetramethylolcyclopentanol, tetramethylolcyclohexanol, are forming nitrates when nitrated with concentrated nitric acid or with mixed acid. These nitrates thus obtained are not known up to now. The ketone alcohols and the cyclic alcohols have been partly described in literature. They result from the condensation of cyclic ketones with formaldehyde in the presence of alkalies or alkaline earths and other alkaline reaction materials. The cyclic alcohols by means of reduction also arise from the respective ketone alcohols. They all may be produced synthetically.

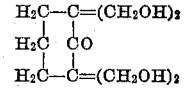
The nitrates of these bodies are very invariable and durable. They withstand long storing at 50° C. without any symptoms of decomposition being noted. Naturally the nitrates of the pure cyclic alcohols have more energetic strength than the ketone alcohols. The melting points of the nitrates are thus that they may be used either separately or in combination with one another or with other explosive materials for the manufacture of cast explosive charges. The velocity of detonation of the nitrates is very high and surpasses sometimes 8000 m per second. These explosives are less sensitive against mechanical stress than the pentaerthrite-tetranitrate. Up to date no explosive materials are known having a similar energetic force and which can be cast at a temperature under 100° C. These explosives thus mean an important progress in the art of making cast explosive charges the more because some of the initial materials are already commercial products and others may be produced by synthetical processes.

The structural formulæ of the compounds mentioned are the following:

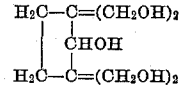
Tetramethylolcyclopentanone



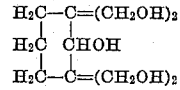
Tetramethylolcyclohexanone



Tetramethylolcyclopentanol



Tetramethylolcyclohexanol



The specific products are

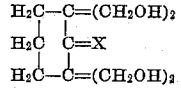
(1) Tetramethylol-cyclopentanon-tetranitrate.

(2) Tetramethylol-cyclopentanol-pentanitrate.

The compounds are partly described in the Reports of The Deutsche Chemische Gesellschaft volume 56 (1923) on page 833 by C. Mannich and W. Brose.

What I claim as new and my invention and desire to secure by United States Letters Patent is:

1. A nitration product of the compound of the formula:



where X=HOH or=O.

2. An explosive composition comprising tetramethylol-cyclopentanol-tetranitrate.

3. An explosive composition comprising tetramethylol-cyclopentanone-tetranitrate.

WALTER FRIEDERICH.