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Sunday, December 4, 2011 02:06

TMDD

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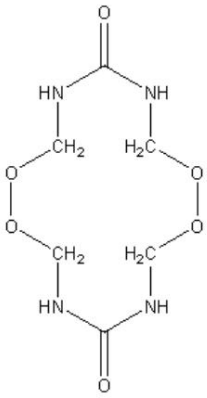

TMDD is an initiating explosive from the peroxide family: 1,3,8,10-tetraase-5,6,12,13-tetraoxacyclotridecane-2,9-dione or TetraMethyleneDiperoxyDike . The density of TMDD is very low: only 0.24g/cm3 . A very similar compound is HMTD and TCAP both in appearance (white, crystalline powder) and in fact equally sensitive to fire, but much less sensitive to mechanical stimuli than HMTD. It can be safely stored for up to a year - without spilling anything, because TMDD decomposes extremely slowly in air. It reacts exothermically with metals, leading to detonation. It burns very quickly in space and detonates in larger quantities, just like HMTD. Received in 1914 by two Germans: Girsewald and Siegens

Reagents:

- Urea (preferably thin) CO(NH2)2
- Formaldehyde 35%-38% (formalin) HCHO
- Perhydrol 35% H2O2
- Nitric acid 65%-70% HNO3 finally sulfuric acid 50% H2SO4
- Water
- 5% sodium bicarbonate solution NaHCO3

Where to get it?

Urea, formalin and nitric acid must be purchased at a chemical store or online. In addition to standard sources, perhydrol can be purchased at a construction store. Contaminated urea can be purchased at a garden store as fertilizer.

Preparation using acid:

Equipment:

- Stirrer
- Source of heat
- Filter or filter
- Water bath
- Thermometer

- Round-bottom flask

Pour 16 ml of formaldehyde (formalin, HCHO aqueous solution) and 22 ml of perhydrol into the flask. Mix everything and add 6g of urea. Urea does not necessarily have to be c - if we use more contaminated urea, especially technical urea, we must wash the final product very well.

Up to this point, the contents of the flask have not heated up, but we place the flask in an ice water bath to cool the solution to 10°C.

Add 12 ml of nitric (or sulfuric) acid dropwise from the dropping funnel, stirring constantly and maintaining the temperature at about 18-20°C.

Crystals may form when adding acid, this is not TMDD, it will dissolve when we add water. After adding all the acid, remove the flask from the bath and set aside for 2 g at room temperature. The mixture should become slightly darker in color. Now add about 100 ml of water. TMDD will precipitate. If we keep the whole thing for 24 hours, we will get 70% TMDD relative to urea and after 48 hours 90%.

(after two hours....)

Stopping it for a longer period of time does not produce any significant effects. The crystals should be washed with plenty of water, then with acetone and a 5% sodium bicarbonate solution.

Obtaining with acid (fast)

Pour 25 ml of aldehyde into the flask and add 15 g of urea. Pour 45mL of perhydrol into the second flask and add 12mL of nitric acid. Mix both solutions carefully together and then heat to 40°C for about 30 minutes. Filter the crystals and wash with sodium hydroxide solution. Then dry the crystals. The profit is very high and is as much as 99% compared to urea.

Obtaining without the use of acid

Pour 20mL of aldehyde into the flask and add 10g of urea. Add 50mL of perhydrol. Then heat the solution to 40°C and maintain the temperature for 48 hours. Filter the crystals and wash them with bicarbonate. Then dry. The profit is about 70% compared to urea.

Safety As it is an
initiating explosive from the peroxide family, it should not be used in quantities larger than 10g. Even though it is less sensitive than HMTD, you should handle concentrated acids with care - follow the pouring order shown. As TMDD is a peroxide it slowly decomposes in air (albeit slower than HMTD) and under HMTD it reacts with metals. It should be handled similarly to HMTD.

If the synthesis was performed correctly, 1.7g of TMDD is equivalent to a number 8 primer.

Article

Little corrections

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