

Citation:

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Perhaps we may find an explanation for this fact in the influence no doubt exerted by the earth's mean magnetic field and the distribution of positive ions in the atmosphere.

These speculations are indeed very rough, but they have one great advantage, viz. to avoid the difficulty, raised by Lord KELVIN, of allowing an expenditure of the sun's energy causing magnetic disturbances, much too great to be admitted.

CHREE (Terr. Magnet. X, p. 9) points to the fact, that also MAUNDER's defined streams require far too great an expenditure of energy.

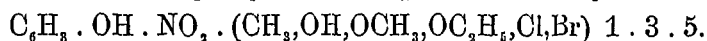
According to my opinion we have only to deal with the charge received at the moment of the impulse, and by accepting an intermittent emission of the sun's energy, it is not necessary to integrate it over the entire time between one or more returns of the stream.

Part of the energy is also supplied by the rotation-energy of the earth; and it is curious to remark, that by such an influence the rotation of the earth would be lengthened for a minute fraction during a magnetic storm.

Chemistry. — "*Nitration of meta-substituted phenols*". By Dr. J. J. BLANKSMA. (Communicated by Prof. HOLLEMAN).

(Communicated in the meeting of September 30, 1906).

Some years ago¹⁾ I pointed out that by nitration of meta-nitrophenol and of 3-5-dinitrophenol tetra- and pentanitrophenol are formed. This showed that the NO₂-groups in the m-position do not prevent the further substitution of the H-atoms in the o- and p-position by other groups. I have now endeavoured to increase these two cases by a few more and have therefore examined the behaviour of some m-substituted phenols which contain, besides a NO₂-group in the m-position, a second group in the m-position, namely of



Of these phenols the 5-nitro-m-cresol²⁾ and the monomethylether of 5-nitroresorcinol³⁾ were known. The still unknown phenols were made as follows:

The 5-nitroresorcinol (m.p. 158°) from its above cited monomethylether by heating for five hours at 160° with (30%) HCl, or by reduction of 3-5-dinitrophenol with ammonium sulphide to 5-nitro-

¹⁾ These Proc. Febr. 22, 1902. Rec. 21. 241.

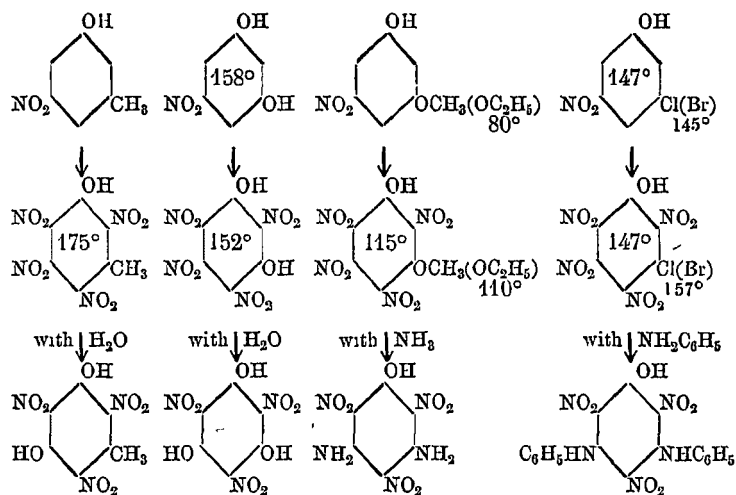
²⁾ NEVILLE en WINTHER Ber. 15. 2986.

³⁾ H. VERMEULEN Rec. 25. 26.

3-aminophenol (m.p. 165°) and substitution of the NH₂-group in this substance by OH.

The monoethylether of 5-nitroresorcinol (m.p. 80°) was prepared (quite analogous to the methylether) from 5-nitro-3-aminophenol; the 3-Cl (Br) 5-nitrophenol was obtained by substituting the NH₂-group in the 5-nitro-3-aminoanisole by Cl (Br) according to SANDMEYER and then heating the 3-Cl (Br)-5-nitroanisole so obtained m.p. (101°¹) and 88°); with HCl as directed. We then obtain, in addition to CH₃Cl, the desired product 3-Cl (Br) 5-nitrophenol (m.p. 147° and 145°).

The 3-5-substituted phenols so obtained readily assimilate three atoms of bromine on treatment with bromine water and three nitro-groups are introduced on nitration with HNO₃ (Sp. gr. 1.52) and H₂SO₄. These last compounds, which all contain four NO₂-groups resemble picric acid, tetra- and pentanitrophenol. From a mixture of nitric and sulphuric acids they crystallise as colourless crystals which are turned yellow by a small quantity of water; the compounds have a bitter taste, an acid reaction and communicate a strong yellow colour to organic tissues (the skin), others strongly attach the skin and all are possessed of explosive properties owing to the presence of four NO₂-groups²).



In this scheme are given only the melting points of the as yet unknown compounds.

Tetranitro-m. cresol yields on boiling with water trinitroresorcinol;

¹) 91° according to DE KOCK Rec. 20, 113.

²) A comparative research as to these properties in the different compounds has not yet been instituted.

in the same manner, tetranitroresorcinol¹⁾ yields trinitrophenol; tetranitrochloro- and bromophenol also yield trinitrophenol on boiling with water or, more readily, with Na_2CO_3 solution. By the action of NH_3 or $\text{NH}_2\text{C}_6\text{H}_5$, etc. in alcoholic solution various other products are obtained, such as those substances included in the scheme which have been obtained previously from pentanitrophenol²⁾. We also see that water or alcohol cannot serve as a solvent for the purpose of recrystallising these compounds but that chloroform or carbon tetrachloride may be used.

If, in the above cited 3-5-substituted phenols the OH-group is substituted by OCH_3 , it is not possible to introduce three nitro-groups. For instance the dimethylether of 5-nitroresorcinol yields two isomeric trinitroresorcinoldimethylethers (principally those with the melting point 195° , just as in the nitration of 5-nitro-m-xylene³⁾); similarly, the methylether of 5-nitro-m-cresol (m.p. 70°) yields the methylethers of three isomeric trinitro-m-cresols, principally the compound with m.p. 139° . The constitution of these substances is not yet determined.

Amsterdam, September 1906.

Chemistry. — Prof. HOLLEMAN presents a communication from himself and Dr. H. A. SIRKS: "*The six isomeric dinitrobenzoic acids.*"

(Communicated in the meeting of September 29, 1906).

Complete sets of isomeric benzene derivatives $\text{C}_6\text{H}_4\text{A}_2\text{B}$ have been studied but little up to the present; yet, for a closer understanding of those derivatives, it must be deemed of great importance to subject the six possible isomers of which such sets consist, to a comparative investigation. A contribution hereto is the investigation of the six isomeric dinitrobenzoic acids which Dr. SIRKS has executed under my directions.

The considerations which guided me in the choice of this series

¹⁾ According to HENRIQUES (Ann. Chem. 215, 335), tetranitroresorcinol (m.p. 166°) is formed by the nitration of 2-5 dinitrophenol. In BEILSTEIN'S manual (vol. II, 926) a reasonable doubt is thrown on the correctness of this observation. The substance obtained has probably been an impure trinitroresorcinol formed by the action of water on the primary formed tetranitrophenol. (Rec. 21, 258).

²⁾ Rec. 21, 264.

³⁾ Rec. 25, 165.