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Effects of Ammonium on Growth and Nutrient Assimilation by Wheat Kinetic Observations Concerning the Uptake of Ammonium by Several Cereals Uptake and Remineralization of Ammonium by Marine Plankton Uptake of Ammonium by Potassium-bearing Silicates in the Guaymas Basin Hydrothermal System, Gulf of California Ammonium Nitrate from Ukraine, Inv. 731-TA-894 (Final) ***Concentration of Ammonium from Dilute Aqueous Solutions Using Commercially Available Reverse Osmosis Membranes*** **Kinetic Observations Concerning the Uptake of Ammonium by Several Cereals** ***A Study of Mechanisms for the Effect of Ammonium on the Availability of Fertilizer Phosphorus to Plants*** **Interrelationships between uptake of urea and uptake of ammonium by microalgae** ***Kinetic Observations Concerning the Uptake of Ammonium by Several Cereals/ Cornelis Lucas Coenraad Meyer*** **A model of ammonia/ammonium conversion and deposition in a hill cap cloud** ***Uptake of Ammonium by Pinus Radiata Seedlings in Low Concentration Solutions*** **Selectivity in the Absorption of Ammonium and Potassium Ion by Excised Barley Root** ***Influence of Ammonium on the Accumulation of Potassium by Barley Seedlings*** **□□□□□□ □□□□□□ □□ □□□□□ Carboxylates and the Uptake of Ammonium by Excised Maize Roots Origin of High Levels of Ammonium in Groundwater, Ottawa County, Michigan A Study of Soil Ammonium Nitrogen in Some Soils of Manitoba Bacterial community responses to Soil-injected liquid ammonium nutrition and effect of temperature on barley (Hordeum vulgare L.) grain yield formation Nitrogen Isotope Analysis of Ammonium and Glycine Clinical Researches on the Therapeutic Action of Chloride of Ammonium in the Treatment of Hepatic Disease GB/T 40395-2021: Translated English of Chinese Standard (GB/T 40395-2021, GBT40395-2021) Formation of Ammonium Nitrate Aerosols by Gas-phase Reaction of Ammonia and Nitrogen Dioxide Sensitization of Ammonium Nitrate by Nitrostarch On the Equilibria in the Systems Consisting of Ammonium Chromate, Ammonium Sulphate and Water, and Ammonium Chromate, Potassium Chromate and Water at 250 C. Clinical Researches on the Therapeutic Action of Chloride of Ammonium in the Treatment of Hepatic Disease** ***Thermal Decomposition and Explosion of Ammonium Perchlorate and Ammonium Perchlorate Propellant Up to 50 Kilobars (5.0 X 109 N/m2)*** **Simultaneous Measurement of Ammonium Absorption and N [C H] - Fixation by Soybeans (Glycine Max [L.] Merr.). Some Effects of Ammonium-nitrogen and Nitrate-nitrogen on the Utilization of Phosphate by Tomato Plants Ammonium Nitrate Facilities Uptake of Ammonium and Nitrate Nitrogen by Rye as Influenced by Fumigation Effects of Ammonium Phosphate and Sulfate on the Pyrolysis and Combustion of Cellulose** ***Leaf-root Interaction in Uptake of Ammonium by the Indonesian Seagrass Thalassia Hemprichii*** **The Dissociation Pressures of Ammonium and Tetramethylammonium Halides and of Phosphonium Iodide and Phosphorus Pentachloride** ***Effects of Ammonium Hydroxide Treatment of Rice Straw on Digestibility and NPN Utilization by Ruminants Separation of***

Hafnium from Zirconium by Multiple Recrystallization of Ammonium Fluozirconates (Lorain Operations Technical Report) **Exothermal Decomposition of Mixtures Containing Ammonium Nitrate Water Quality. Determination of Ammonium Nitrogen. Method by Flow Analysis (Cfa and Fia) and Spectrometric Detection Studies on Dissimilatory Reduction of Nitrate to Ammonium by Soil Clostridia Assessment of the Potential for Ammonium Nitrate Formation and Reaction in Tank 241-SY-101**

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Excerpt from Clinical Researches on the Therapeutic Action of Chloride of Ammonium in the Treatment of Hepatic Disease: With Illustrative Cases and Rules Regarding the Auxiliary Treatment, Diet, and Management of Patients Suffering From Congestion of the Liver and Tropical Hepatitis BY the advice of several medical friends, and acting on the suggestions of the late Sir R. Martin and Dr. C. Murchison, (of whose death in the prime of life and usefulness the sad news has just reached this country,) I have, at length, in the following pages brought together in a connected form the substance of my various papers on the treatment of hepatic disease, as they appeared from time to time in various journals at home and abroad. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works. In April 2013, about 30 tons of ammonium nitrate fertiliser detonated during a fire at a facility in West, Texas, killing at least 14 people and damaging nearby schools, homes, and a nursing home. This incident raised concerns about the risks posed by similar facilities across the country. The Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) play a central role in protecting workers and communities from chemical accidents, and the Department of Homeland Security (DHS) administers a chemical facility security program. This book addresses how many facilities have ammonium nitrate in the United States; how OSHA and EPA regulate and oversee facilities that have ammonium nitrate; and what approaches selected other countries have adopted for regulating and overseeing facilities with ammonium nitrate. It also focuses on some of the federal regulatory programs overseeing storage of ammonium nitrate and anhydrous ammonia by retailers. This work has been selected by scholars as being culturally important, and is part of the knowledge base of civilization as we know it. This work was reproduced from the original artifact, and remains as true to the original work as possible. Therefore, you will see the original copyright references, library stamps (as most of these works have been housed in our most important libraries around the world), and other notations in the work. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate)

has a copyright on the body of the work. As a reproduction of a historical artifact, this work may contain missing or blurred pages, poor pictures, errant marks, etc. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant. The rates of thermal decomposition of ammonium perchlorate and an ammonium perchlorate solid propellant at 15, 25, and 50 kilobars (1.5X10 , 2.5X10 , and 5.0XlO N/m) pressure were studied in a cubic anvil press. The data were correlated by first order rate equations to obtain the temperature variation of the specific reaction rates and the apparent activation energies. Explosion limits of pure ammunium perchlorate are included to 30 kilobars (3. OXlO9 N/m2). Electrical resistance measurements of this salt at high pressure were also made. This document specifies the method for the determination of free ammonia and ammonium ions in methanol for industrial use by ion chromatography. This document applies to the determination of free ammonia and ammonium ions in methanol for industrial use. When the injection volume is 50 µL, the lower limit of determination is 0.01 mg/L. Water, Water testing, Determination of content, Nitrogen hydrides, Ammonia, Chemical analysis and testing, Flow analysis, Instrumental methods of analysis, Spectroscopy, Spectrochemical analysis, Samples, Calibration, Test equipment, Testing conditions, Concentration (chemical), Interferences (chemical), Specimen preparation, Statistical methods of analysis A study was made of soil ammonium nitrogen of different types of soils of Manitoba. Methods used were: 1. Potentially available Nitrogen (PAN) determined according to the method suggested by Purvis and Leo (73); 2. Exchangeable ammonium determined according to the method described by Jackson (54). The PAN and exchangeable ammonium nitrogen were evaluated by statistical comparison with two weeks incubation nitate nitrogen. In general PAN values, in forty-five surface soils of Manitoba Province, correlated highly significantly with two weeks incubation nitate nitrogen... The recoveries of the added ammonium nitrogen as exchangeable ammonium by extracting with 10 per cent NaCl solution of pH 2.5, and as nitrate after four weeks of incubation of soils at 30oC reveal that considerable amounts of added ammonium nitrogen is lost in calcareous soils. This loss is attributed mainly to gaseous loss of ammonia as these calcareous soils have alkaline pHs. Another possible reason is that larger amounts of calcium present in these soils might be inhibiting nitrification as addition of 20 per cent of calcium carbonate to a highly fertile soil has reduced its nitrification about 74 per cent. Nitrogen uptake percentages of ammonium nitrogen added to calcareous soils are also lower than those for non-calcareous soils. The nitrogen uptake percentages in general are comparable to the recoveries of added ammonium nitrogen to soils as exchangeable ammonium by extracting soils with 10 per cent sodium chloride solution of pH 2.5. Stable isotope techniques can be used as a tool in nitrogen cycling studies of different ecosystems. The studies are based on measurement of the heavy (15N)- to- light (14N) isotopic ratios of nitrogen in different biospheric pools. Isotope ratio mass spectrometry (IRMS) is the most precise technique to use for analysis of nitrogen isotopic ratios. This thesis deals with the development of methods for compound-

specific nitrogen isotope analysis of ammonium and glycine in aqueous solutions and soil extracts using Gas Chromatography - Combustion (GC-C) - IRMS. For ammonium, three different techniques were developed: equilibrium headspace analysis, solid phase microextraction (SPME) and the purge and trap (P & T) technique, which were all based on conversion of ammonium to ammonia with subsequent separation of ammonia for analysis. In the SPME and P & T approaches, custom-made absorbents were used for pre-concentration, followed by thermal desorption into the GC-C-IRMS system. For the equilibrium headspace technique, high precision measurements of the nitrogen isotopic ratio were obtained for concentrations above 420 mg N L-1. With further improvements and the use of suitable equipment, the method has the potential to be used for solutions containing ammonium in the low mg N L-1 range. The SPME technique increased the sensitivity by a factor of » 3 compared to the headspace technique, but was less precise. In addition, the NafionÒ material used for absorption showed a memory effect in the desorption step. With the P & T technique a large variation in the measured isotopic value was observed (using solutions containing 2 mg N L-1) which was due to a non-quantitative thermal desorption. However, with further improvements, the P & T technique has the potential to be used for samples containing below 1.0 µg N, which is a much lower amount than that possible with any method used today. A method for determination of the nitrogen isotopic ratio in free glycine in soil extract Groundwater from wells located in and around Hemlock Crossing Park in Ottawa County, Michigan has elevated levels of ammonium. High ammonium concentrations in potable water wells are a common indicator of anthropogenic impact, such as landfill leachate or agricultural activity. Ammonium can also occur in groundwater through the decay of natural organic material. Along with the retrieval of a complete glacial sediment core via rotasonic drilling, numerous chemical and isotopic parameters were used to determine the source of ammonium in the impacted aquifer. Buried organic material, deposited during the Athens subepisode interglacial period, is in contact with groundwater containing elevated concentrations of ammonium and iron. High methane concentrations signify methanogenic conditions in the aquifer system and indicate very reducing conditions. A multi-isotopic approach provides evidence that the aquifer system is not receiving recent recharge influenced by agricultural activity. Nitrogen isotopes support that the ammonium most likely originated from in situ organic material and not from anthropogenic sources. Potable wells in the confined aquifer system are at risk from the potential impact of methane migration and nitrification of ammonium, along with the aesthetic impact of high chloride concentrations. Injection of concentrated liquid ammonium nutrition into soil is an agricultural practice aimed at mitigating nitrogen losses. In Germany, it is referred to as controlled uptake long term ammonium nutrition (CULTAN) technique. In many soils, nitrate is mobile because as an anion, it is not bound to negatively charged surfaces of clay minerals or organic soil compounds. In contrast to phosphate, it is not specifically adsorbed. Nitrate fertilization may thus result in leaching and presents a potential environmental hazard. Ammonium ions, on the other hand, may be unspecifically bound to negatively charged surfaces or even fixed in inter-layers of 2:1 clay

minerals. Following the injection of concentrated liquid ammonium into soil, ammonium is the predominant N nutrition form suggesting its stability in soil. After 30 days, though ammonium persisted in the soil, its concentration had drastically decreased. Unspecifically bound ammonium may be exchanged and readily oxidized to nitrate by nitrifying bacteria. Bacterial community occurrence within the perceived toxic ammonium injection-zones facilitated transformation of ammonium to nitrate. This resulted into a rapid reduction of ammonium due to microbial as well as crop uptake. Along side the reductions in ammonium concentrations, nitrate concentrations increased rapidly as the season progressed. The incorporation of nitrification inhibitor (Nitrapyrin®) improved the stability of injected liquid ammonium by suppressing the nitrification process. However, the inhibitor did not express any direct effect on ammonium concentration reductions. It suppressed the transformation of ammonium into nitrate. Non-incorporation of the inhibitor caused the formation of high concentrations of nitrate. The transformation of ammonium to nitrate under CULTAN fertilization suggests that the technique offers mixed nitrogen nutrition contrary to earlier assumptions that it supplies predominantly ammonium. The nitrogen switch from predominant ammonium to mixed nitrogen through the availability of partial nitrate is deemed to have played a role in the alleviation of ammonium toxicity symptoms commonly associated with crops fertilized with ammonium. Though mixed nitrogen nutrition is usually reported to produce superior grain yields, none was recorded in this study. This study has provided the first molecular evidence demonstrating the occurrence of bacterial communities in CULTAN-fertilized soils contrary to the presumption that ammonium injected zones remain highly toxic and never allow any microbial inhabitation and/or any substantial activity. In addition to this, the presumed toxic zones with high ammonium concentrations and acidic pH levels supported the highest diversity of bacterial communities. This diversity shifted spatio-temporally with regard to distance from injection zones and time after the injection was performed. Analysis of ammonia monooxygenase sub-unit A (amoA) gene revealed the occurrence of ammonia oxidizing bacteria (AOB) within these same toxic zones where their functional role is thought to have mainly been nitrogen transformation, especially in non-inhibitor incorporated ammonium treatments. Despite the presence of a large bacterial diversity in the early part of the season, it decreased as the season progressed. Though temporal bacterial community shifts also occurred (30 and 60 days after fertilization) with decreasing ammonium concentration and changing pH levels. The banding pattern seemed to have been restored to the original patterns of nitrate and non-fertilized control. This suggests the occurrence of an endogenous stability of the bacterial community structure over the season. This is an indication that CULTAN fertilization effects are not permanent, but only transient. The population of ammonia oxidizing bacteria in the treatment experiencing 'mixed nitrogen nutrition' had the highest estimates of population abundance. This illustrates that high nitrification rates per se did not support the high population occurrence, but rather supported root exudation, which could have influenced the rhizosphere by improving microbial nutritional resources and suitable niches. It can be generally concluded from this study that growth temperatures interact with CULTAN-

injected liquid ammonium to cause a suite of growth responses such as growth duration alterations, tillering and ear formation which have a great impact on grain and biomass yields. Crop growth rate among different phenological stages influenced grain yield and yield forming-factors which significantly affected yield output. The role of temperature on microbial activity, especially the nitrification of injected liquid ammonium can not be ruled out. The possible occurrence of mixed nitrogen and crop growth durations could have also contributed to superior grain and biomass yields under low temperatures. These findings could be useful temperate and tropical regions. An aqueous-phase cloud-chemistry model is used to investigate the conversion of ammonia gas to ammonium aerosol in an air stream as it passes through a hill cap cloud. The sensitivity of the conversion to the scavenging of soluble gases such as SO2 and HNO3, and to the sulphur chemistry occurring in the cloud, is investigated. The subsequent effect of conversion on the pattern of deposition of reduced nitrogen (NHx) to the surface before, during and after processing by the cap cloud is also considered. The fraction of ammonia present in the inflowing air stream converted to ammonium depends critically on the ratio of ammonia to the concentration of all other species present in solution with which it is capable of forming stable ammonium salts. If sulphate, generated by the oxidation of S(IV) in solution by ozone (and hydrogen peroxide when available), is the only such species, ammonium production is directly linked to sulphate production. When aqueous ammonia is in deficit to acidic species (e.g. HSO3-), at least 85% of the input ammonia is converted to ammonium. When ammonia is in excess, the fraction of ammonia converted to ammonium depends upon the degree of this excess. It is calculated that conversion of ammonia to ammonium changes patterns of deposition of reduced nitrogen to the surface significantly. Within the cap cloud the efficient deposition of ammonium in cloud droplets (compared with the less efficient deposition of submicron aerosol) dominates over the dry deposition of ammonia gas, most of which is absorbed into the aqueous phase of the cloud. This generates a total reduced- nitrogen flux within the cloud that is typically several times larger than the pre-cloud flux. To the lee of the cap cloud, deposition of reduced nitrogen is also predicted to be much lower than pre-cloud values. This lowered deposition results firstly from the depletion of gas-phase ammonia, and secondly from the inefficient deposition of aerosol particles which individually car. Two principal scenarios by which ammonium nitrate may be formed were considered: (a) precipitation of ammonium nitrate in the waste, and (b) ammonium nitrate formation via the gas phase reaction of ammonia and nitrogen dioxide. The first of these can be dismissed because ammonium ions, which are necessary for ammonium nitrate precipitation, can exist only in negligibly small concentrations in strongly alkaline solutions. Gas phase reactions between ammonia, nitrogen dioxide, and water vapor in the gas phase represent the most likely means by which ammonium nitrate aerosols could be formed in Tank 241-SY-101. Predicted ammonium nitrate formation rates are largely controlled by the concentration of nitrogen dioxide. This gas has not been detected among those gases vented from the wastes using Fourier Transform Infrared Spectrometry (FTIR) or mass spectrometry. While detection limits for nitrogen dioxide have not been

established experimentally, the maximum concentration of nitrogen dioxide in the gas phase in Tank 241-SY-101 was estimated at 0.1 ppm based on calculations using the HITRAN data base and on FTIR spectra of gases vented from the wastes. At 50 C and with 100 ppm ammonia also present, less than one gram of ammonium nitrate per year is estimated to be formed in the tank. To date, ammonium nitrate has not been detected on HEPA filters in the ventilation system, so any quantity that has been formed in the tank must be quite small, in good agreement with rate calculations. The potential for runaway exothermic reactions involving ammonium nitrate in Tank 241-SY-101 is minimal. Dilution by non-reacting waste components, particularly water, would prevent hazardous exothermic reactions from occurring within the waste slurry, even if ammonium nitrate were present. 41 refs.

Michigan

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