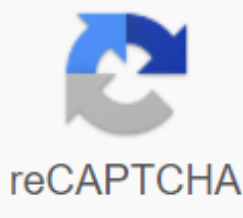




I'm not robot



Continue





Urea Ammonia Nitrate Solution. Liquid fertilizer solutions and fluid fertilizers are popular in many areas because they’re safe to handle, convenient to mix with other nutrients and chemicals, and are easily applied. A solution of urea [CO(NH2)2] and ammonium nitrate [NH4NO3] containing between 28 and 32 percent nitrogen (N) is the most popular fluid N fertilizer. Production Liquid urea-ammonium nitrate (UAN) fertilizer is relatively simple to produce. A heated solution containing dissolved urea is mixed with a heated solution of ammonium nitrate to make a clear liquid fertilizer. Half of the total N comes from the urea solution and half from the ammonium nitrate solution. UAN is made in batches in some facilities or in a continual process in others. No emissions or waste products occur during mixing. Since UAN is a concentrated N solution, its solubility increases as the temperature rises. To prevent the N components from precipitating as crystals, manufacturers make the UAN solutions more dilute in regions with cold winter temperatures. Therefore, the N concentration in commercial UAN fertilizers will vary from 28 to 32 percent, depending on geography. A corrosion inhibitor is usually added to the final solution to protect the steel in storage tanks. Agricultural use Solutions of UAN are widely used as a source of N for plant nutrition. The NO3- portion (25 percent of the total N) is immediately available for plant uptake. The NH4+ fraction (25 percent of the total N) can also be assimilated directly by most plants, but is rapidly oxidized by soil bacteria to form NO3- (nitrate). Soil enzymes hydrolyze the remaining urea portion (50 percent of the total N) to form NH4+, which subsequently transforms to NO3- in most soil conditions. Solutions of UAN are extremely versatile as a source of plant nutrition. Its chemical properties, make UAN compatible with many other nutrients and agricultural chemicals, so its frequently mixed with solutions containing phosphorus, potassium and other essential plant nutrients. Fluid fertilizers can be blended to precisely meet the specific needs of a soil or crop. UAN solutions are commonly injected into the soil beneath the surface, sprayed onto the soil surface, dribbled as a band onto the surface, added to irrigation water, or sprayed onto plant leaves as a source of foliar nutrition. However, UAN may damage foliage if it’s sprayed directly on some plants, so dilution with water may be needed. Management practices Though UAN makes an excellent source of N nutrition for plants, since half of the total N is present as urea, extra management may be required to avoid volatile losses. When UAN remains on the surface of the soil for extended periods (a few days), soil enzymes will convert the urea to ammonium (NH4+), a portion of which can evaporate as ammonia gas. Therefore, to avoid significant loss, UAN should not remain on the soil surface for more than several days. Inhibitors that slow these N transformations are sometimes added. When UAN is first applied to soil, the urea and the NO3- molecules will move freely with water in the soil. The NH4+ will be retained in the soil where it first contacts cation exchange sites on clay or organic matter. Within two to 10 days, most of the urea will be converted to NH4+ and no longer be mobile. The originally added NH4+ plus the NH4+ coming from urea will eventually be converted to NO3- by soil microorganisms. Source: Nutrient Source Specifics, No. 7, International Plant Nutrition Institute (IPNI) Ammonium Nitrate vs Urea Compounds containing Nitrogen are commonly used as fertilizers because nitrogen is one of the highly essential elements for plant growth and development. Ammonium nitrate and urea are such nitrogen containing solids. Ammonium nitrate Ammonium nitrate has the chemical formula of NH4NO3. This is the nitrate of ammonia, and it has the following structure. At room temperature and standard pressure ammonium nitrate exist as an odorless, white crystalline solid. This is an acidic salt with a pH of about 5.4. Its molar mass is 80.052 g/mol. Melting point of ammonium nitrate is about 170 °C and it decomposes when heated to about 210 oC. Ammonium nitrate is primarily used for agricultural purposes. It is rich in nitrogen, so it is used as a fertilizer, to supply nitrogen to plants. Since its direct contact with chemical is not hazardous and toxicity of it is less, it is beneficial to use as a fertilizer. Moreover, heating or ignition causes ammonium nitrate to explode. Therefore, it is used as an oxidizing agent in explosives. Because of this explosive nature, when storing ammonium nitrate we should be extra careful. Ammonium nitrate is stable, but when it is in the molten state risk for explosion is higher. The risk increases if it comes to contact with oxidizable materials such as oil, diesel, paper, rag, or straw. Production of ammonium nitrate is a simple chemical reaction. When nitric acid is reacted with ammonia liquid, ammonium nitrate in the solution form is produced. Industrially, concentrated nitric acid and ammonia gas are used for production. Since this is a highly exothermic and violent reaction, it is challenging to produce it in large scale. Being a salt, Ammonium nitrate is highly soluble in water. Therefore, when it is used as a fertilizer can be washed off and accumulates in water bodies. This could be a fatal condition for aquatic life. Urea Urea has the molecular formula of CO(NH2)2 and the following structure. It is a carbamide with the functional group C=O. Two NH2 groups are bonded to the carbonyl carbon from two sides. Urea is naturally produced in mammals in nitrogen metabolism. This is known as the urea cycle, and oxidation of ammonia or amino acids produce urea inside our bodies. Most of urea is excreted through kidneys with urine whereas some are excreted with sweat. The high water solubility of urea is helpful when excreting it from the body. Urea is a colorless, odorless solid, and it is non-toxic. Other than being a metabolic product, its main use is to produce fertilizer. Urea is one of the most common nitrogen releasing fertilizers, and it has a high nitrogen content compared to other solid nitrogenous fertilizers. In soil, urea is converted to ammonia and carbon dioxide. This ammonia can be converted to nitrite by soil bacteria. Further, urea is used to produce explosives like urea nitrate. It is used also as a raw material to produce chemicals like plastics and adhesives. What is the difference between Ammonium Nitrate and Urea? • Molecular formula of ammonium nitrate is NH4NO3. Molecular formula of urea is CO(NH2)2. • Ammonium nitrate is a salt, whereas urea is not. It is a carbamide (organic molecule). • When dissolved in water ammonium nitrate produces an acidic solution. In contrast urea solutions are neither acidic nor alkaline. Half of the total N comes from the urea solution and half from the ammonium nitrate solution. UAN is made in batches in some facilities or in a continual process in others. No emissions or waste products occur during mixing. Since UAN is a concentrated N solution, ... UREA, AMMONIUM NITRATE SOLUTION, (W/AQUA AMMONIA) is a basic solution. Reacts exothermically with acids. Can react with both oxidizing agents and reducing agents. May be subject to detonation if allowed to dry out. What is the difference between Ammonium Nitrate and Urea? • Molecular formula of ammonium nitrate is NH 4 NO 3. Molecular formula of urea is CO(NH 2) 2. • Ammonium nitrate is a salt, whereas urea is not. It is a carbamide (organic molecule). • When dissolved in water ammonium nitrate produces an acidic solution. urea ammonia nitrate

