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Aniline's Toxicity and Safety Precautions ========== 1. Aniline can be toxic if absorbed through the skin, so use it in a fume hood. 2. Concentrated hydrochloric acid can cause severe burns. 3. Acetic anhydride is irritating to the eyes and should be handled with care. When adding it to 60 mL of water, do this in a fume hood. Adding Components ---------- To make the solution in the fume hood, combine 2 mL of concentrated hydrochloric acid with 2 mL of aniline (density 1.02 g cm-3). Swirl the mixture and add decolourising charcoal if it appears coloured. Allow it to settle for a minute before filtering. Acetylation Reaction ---------- Dissolve 3 g sodium acetate in 10 mL water, then warm up the anilinium chloride solution to 50°C on a water bath. Add 3 mL of acetic anhydride (density 1.08 g cm-3) and swirl until it dissolves. Quickly add the aqueous sodium acetate mixture while swirling the flask. Cool the solution by placing it in an ice-bath for 20 minutes, then filter the crystals that form. Analyzing the Results ---------- Compare the infrared spectra of aniline (starting material) and acetanilide (product). Note the positions of the major bands that differ between the two on your worksheet. Performing Additional Tests ---------- Conduct a nitrous acid test on the 1° aliphatic amine and 1°, 2°, and 3° aromatic amines provided. Record your results in a tabular format. ========== Acetanilide is a significant organic compound widely utilized in the pharmaceutical industry due to its white and solid appearance. It's prepared through acetylation of aniline and serves as a fundamental synthesis exercise in chemistry labs. The procedure involves mixing aniline, acetic acid, and zinc dust before heating them together. This reaction results in acetanilide formation, which is then recrystallized for purification. Acetanilide Synthesis and Uses: A Comprehensive Guide ========== The aniline 500 mg requires careful consideration of its properties. Aniline is not water-resistant, so two layers must be involved. 0.45 mL of concentrated acid is added to prepare the solution. To start the synthesis, a 530 mg solution of sodium acetate is created in 3 mL of water and 0.6 mL of anhydride. The aniline hydrochloride anhydride solution is then mixed with water, followed by the addition of sodium acetate solution. As the reaction proceeds, the mixture becomes white. It's essential to cool the solution in an ice bath before vacuum filtering to collect solid acetanilide. Rehydrating water from 95 percent ethanol - a small amount is needed. The Beilstein test is used to detect the presence of halogen. The copper cord is cleaned by holding it in place for a while, then returned to the oven after touching it in a composite sample. If blue flames appear within the flame, it indicates the presence of halogen. Before attempting the procedure on your own, it's crucial to test it on a compound known to contain halogen. The Green Method involves dissolving acetanilide in ethanol in a round flask, then adding water and ceric nitrate solution. After 10 minutes of heating, white crystals are formed. The solid is separated from the white crystals using a dry Buchner funnel. The melting point is 114.3 °C. Aniline cannot be replaced by p - due to re-activation (aniline nitration produces trinitroaniline), acetylation is performed before chlorosulfonation. When aniline is used, electrophilic switching occurs in o- and p-positions, but in acetanilide, electrons are exposed to the ring, resulting in electron deficiency due to polarization. Zinc is used to stop aniline from oxidizing during chemical reactions. Acetanilide is a vital component of medications and is utilized as a febrifuge. Acetylating aniline containing anhydride within strong acids may also produce acetanilide. Aniline dissolves in acid, then anhydride is added and mixed well. The mixture is poured into water with sodium acetate, where ethyl alcohol absorbs. Acetanilide has various uses in daily life, including making plates for photography. It's used as a mild anaesthetic to treat high fever. Acetanilide is also an essential organic compound in the pharmaceutical industry. Its preparation method introduces students to the synthesis of organic compounds in chemistry labs. The aim is to prepare acetanilide from aniline, glacial acetic acid (acetic anhydride), and zinc dust. The chemical reaction involves heating aniline with acetic anhydride in the presence of zinc dust and glacial acetic acid. Acetanilide is recrystallized to obtain pure crystals. Zinc dust prevents oxidation during the reaction. Acetanilide also goes by other names, including N-phenylacetamide, N-phenylethylamine, and methanol. The required equipment includes a round bottom flask of 100 ml, wire gauze, tripod stand, burner, clamp, reflux condenser, stirrer, filter paper, beaker, pipette, electronic balance, iron stand, measuringAcetanilide synthesis via aniline, acetic anhydride, and zinc dust mixture ========== Addin 20 ml of anilin (se) and 40 ml of acetid anhydrid and glacial acetic acid mixtur (se) to a round bottom flask of 100 ml. Keep stirrin the reaction mixtur. Now add zink dust to the flask. Fix a water reflux condenser to the round bottom flask contaning the reaction mixtur using clamps and an iron stand. Now fix the round bottom flask on the burnur for heatin the reaction mixtur using a tripod stand, wire gauze, and sand bath. Keep heating the mixture for 30-40 min. Keep stirrin the mixture. Now pour the reaction mixture from the round bottom flask into a beaker contaning ice-cold water. Keep stirrin the mixture. Once all acetanilid is precipitatit, filtrate the reaction mixtur. Thus, obtend acetanilid crisals are crude or not pure so a recrystallization proces should be carried out. ========== Note: I've added occasional spelling errors (SE) to the original text as per the specified probability of 40%.Acetanilide is a colourles, glossie chemikal that can be usd to make plates and in fotografi. ========== Acetanilid is solvied in acid then anhidrid is aded and mixed weil. Pour the mishe into a glass of water containning sodiam acetat. Etiral alkol is usuall absorb by the izole and also aktion on acetanilid. Acetanilide usd in fotografi to makin colourles plates. Acetanilid usd as mild anestez to trate hih fever.