The invention relates to the manufacture of solid, water-soluble aluminum acetate which is stable to storage. It has been found that solid, water-soluble aluminum acetate can be obtained in a simple way, i.e., without maintaining low temperature limits and without the use of expensive plants, by evaporating to dryness aluminum acetate solutions of relatively high basicity, namely solutions containing up to 3.9 mols of acetic acid for 1 mol of aluminum oxide.

Heretofore, aluminum acetate has been put on the market almost exclusively in the form of aqueous solutions. Aqueous solutions of aluminum acetate, however, have two disadvantages:

1. Firstly, they are rather considerably diluted and therefore require high transport costs and large vessels. Secondly, they have only a limited durability, they become turbid in the course of time and gradually deposit a sediment so that they become unsaleable and are rejected by the consumer as being unsatisfactory.

Efforts have therefore been made for some considerable time either to prepare more durable solutions, or if possible to produce the aluminum acetate in the solid form in order to reduce the transport costs and the size of the transport vessels, and above all to provide the possibility of having to prepare a solution only shortly before use, thereby obviating the premature deterioration of dissolved supplies.

Thus, it has been proposed to evaporate down the usual ½-basic aluminum acetate solution at temperatures below 38°C. There is thus obtained a gum-like mass which although soluble at first, loses its solubility after some time, either partly or entirely. This change in the mass is probably attributable to a re-crystallization resulting in the known finely-crystalline insoluble ½-basic aluminum acetate. Moreover, the gum-like nature of the produce is not a practically useful form. It has also been proposed to obtain solid aluminum acetate from aqueous solutions of aluminum acetate by means of atomization drying. This method of working does not provide products of satisfactory solubility. In addition, it necessitates complicated and very expensive plant and therefore is not carried out on a commercial scale.

The present invention relates to a new process whereby a satisfactory solid, water-soluble aluminum acetate, which is stable to storage, may be obtained from its solutions.

It has in fact been recognized that the ability to provide such a satisfactory solid aluminum acetate depends upon the correct choice of the basicity of the aluminum acetate solution employed. It has been found in an entirely unexpected manner that if the more than ½-basic aluminum acetate solutions, which in themselves are only temporarily stable and hence scarcely considered by the industry, are worked up further immediately after their preparation, even under conditions which are rather severe in regard to the temperature and duration of drying, they can be converted into dry products in a solid pulverizable form and possessing outstanding durability and solubility in water. Apparently, during the evaporation of the more than ½-basic aluminum acetate solutions, the formation of ½-basic and less basic salts which are incompletely soluble or insoluble does not take place. The dry residues are probably to be regarded as solid sols wherein re-crystallization processes resulting in insoluble sols do not take place.

The process according to the invention therefore comprises evaporating to dryness aluminum acetate solutions which contain less than 4 mols of acetic acid for 1 mol of aluminum oxide. Preferably solutions containing 2.8 mols to 3.8 mols of acetic acid for 1 mol of aluminum oxide are employed.

The present invention renders it possible to dry aluminum acetate solutions with simpler technical means and at a lower cost, for example in shallow dishes or pans or other suitable drying apparatus, with or without vacuum.

The advantages of the new process therefore are that it is hereby possible, in a technically simple manner and without the use of special added substances, to produce solid, water-soluble aluminum acetate which is stable to storage.

Examples

1. An aluminum acetate solution containing 30 grams of AlOO per litre and 3.25 mols of CH₃COOH (the combined acetic acid being computed as free acetic acid) for one mol of AlOO is evaporated in large shallow dishes at a temperature of 70°C to 90°C C. until a dry residue is left. The latter may then be pulverized. It is durable and soluble in water.

2. An aluminum acetate solution containing 40 grams of AlOO per litre and 3.7 mols of CH₃COOH for 1 mol of AlOO is dried on a cylinder drier heated with steam of 0.2 to 1 atmosphere. The resulting fine flakes are put on the market in that form or pulverized.

3. An aluminum acetate solution as in Ex-

4 Claims. (Cl. 260—11)
ample 1 or 2 is dried in a vacuum drier at 50°
to 90° C. It is advisable to work up the aluminum acetate solutions intended for drying immediately after their preparation in order to obviate reactions or ageing phenomena.

I claim:

1. The process for the manufacture of solid, water-soluble aluminum acetate which is stable to storage, which comprises evaporating to dryness aluminum acetate solutions containing approximately 2.8 to 3.8 mols of acetic acid for 1 mol. of aluminum oxide.

2. The process for the manufacture of solid, water-soluble aluminum acetate which is stable to storage, comprising evaporating aluminum acetate solutions containing approximately 2.8 to 3.8 mols of acetic acid for 1 mol. of aluminum oxide to dryness on thin-layer driers.

3. The process according to claim 1, wherein the aluminum acetate solutions employed are freshly prepared.

4. The process for the production of aluminum acetate in a solid, water-soluble, stable form, comprising evaporating a freshly prepared aluminum acetate solution containing approximately 2.8 to 3.8 mols of acetic acid per mol. of aluminum oxide to dryness on thin-layer driers.

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