

Question

How acetylglycine is prepared by reaction of glycine with acetic anhydride experimentally?

Answer

The experimental procedure of acetylglycine preparation is as follows.

75 g (1 mole) of glycine and 300 ml of water are placed in a 1-liter Erlenmeyer flask fitted with a mechanical stirrer. The mixture is stirred vigorously until the glycine is almost completely dissolved. Then 215 g (2 moles) of 95% acetic anhydride (the equivalent quantity of 90% acetic anhydride may be used) is added in one portion. Vigorous stirring is continued for 15-20 min. During this time the solution becomes hot and acetylglycine may begin to crystallize.

The solution is placed in the refrigerator (maintained a temperature of 5–7°C) overnight to effect complete crystallization. The precipitate is collected on a Büchner funnel, washed with ice-cold water, and dried at 100–110°C. This product weighs 75–85 g and melts at 207–208°C. The combined filtrate and washings are evaporated to dryness under reduced pressure on a water bath at 50–60°C. The residue on recrystallization from 75 ml of boiling water yields a second fraction, of 20–30 g, which melts at 207–208°C after being washed with ice-cold water and dried at 100–110°C. An additional 4–6 g of only slightly less pure product may be obtained from the mother liquor by concentration.

The total yield is 104–108 g (89–92 % of the theoretical amount).