

Preparation of caprolactam

Abstract

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Caprolactam is prepared by heating 6-aminocapronitrile in the presence of a heterogeneous catalyst and water under super-atmospheric pressure by a method in which

- 10 (a) 6-aminocapronitrile, or a mixture containing essentially 6-aminocapronitrile, and water and a low-boiling or a high-boiling alcohol are heated in the presence of a heterogeneous catalyst in a reactor A to give a mixture I,
- 15 (b) mixture I is then distilled to give a top fraction, caprolactam and a bottom product, ammonia being removed before the distillation if it is present in mixture I, and then
 - 20 (c1) the top fraction is fed into the reactor A of stage (a), if desired the top fraction being mixed with the alcohol or water or 6-aminocapronitrile used in stage (a) before being fed into the reactor A, or
 - 25 (c2) the top fraction, if desired with the bottom product from stage (b), is fed into a reactor B, the top fraction being mixed, if desired, with the alcohol or water or 6-aminocapronitrile used in stage (a) before being fed into the reactor B, and caprolactam is then obtained similarly to stage (b) by distillation, and either
 - 30 (d1) the bottom product from stage (b) is fed into the reactor A of stage (a) or
 - 35 (d2) if desired water and if desired a low-boiling or a high-boiling alcohol are added to the bottom product and the latter is then heated similarly to stage (a) in a further reactor C to give a reacted mixture, from which caprolactam is obtained by distillation, or
 - 40 (d3) water is added to the bottom product, which is then heated in a reactor D without the addition of a catalyst to give a reacted mixture, and caprolactam is obtained from said reacted mixture by distillation, or
 - 45 (d4) the bottom product to which water and a base have been added is heated in a reactor E to give a reacted mixture, from which caprolactam is obtained by distillation.