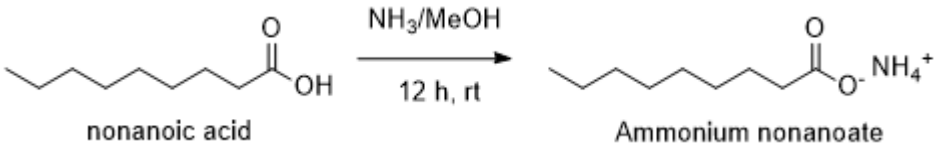
Answer on Question#69418 – Chemistry – Organic chemistry

Question: How to synthesis 1.0kg Ammonium nonanoate from nonanoic acid. Request to provide full reaction mass details

Answer:



nonanoic acid Ammonium nonanoate

M(ammonium nonanoate) = 175.27 g/mol

n(Ammonium nonanoate) = 1000 g : 175.27 g/mol = 5.71 mol

An average yield in the reaction is about 90%, so we need $\frac{5.71\ mol}{0.9} \approx 6.35\ mol$ of nonanoic acid for preparing 5.71 mol of ammonium nonanoate.

M(nonanoic acid) = 158.24 g/mol

m(nonanoic acid) = 158.24g/mol × 6.35mol ≈ 1005 g

We have to use 2 equivalents of 7N solution of ammonia in methanol for the reaction.

$n(NH_3)$ = 2 × 6.35 mol = 12.7 mol

V(7N NH_3 in methanol) = 12.7 mol : 7 mol/L = 1.81 L ≈ 2 L

Procedure: 1005 g of nonanoic acid and 2L of 7N ammonia in methanol are stirred in 4L reactor 12 hours at room temperature. Methanol is removed by rotor evaporator (t≤45°C). White solid crystals is ammonium nonanoate.