





## Benzylurea from benzylamine

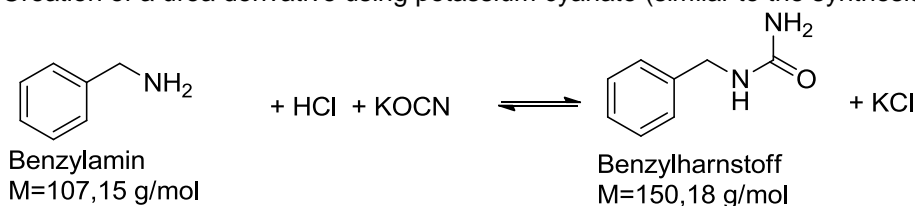
<u>Chemicals</u>	<u>Material</u>
<ul style="list-style-type: none"><li>• Benzylamine</li><li>• Hydrochloric acid, conc.</li><li>• Potassium cyanate</li><li>• Ethyl alcohol</li><li>• Activated carbon</li><li>• Water, dist.</li></ul>	<ul style="list-style-type: none"><li>• 500 mL multiple neck flask</li><li>• pH-paper</li><li>• Lifting platform</li><li>• Beaker glasses</li><li>• Funnel for liquids</li><li>• Measuring cylinder (2x 50 mL)</li><li>• Dropping funnel</li><li>• Glass stirrer</li><li>• Solid matter funnel</li><li>• Thermometer with ground joint</li><li>• Clamps and screwed joints</li><li>• Heating basket</li><li>• Stirring motor with stirrer and stirring locking</li><li>• Drying oven</li><li>• Analysis balance</li><li>• Reflux condenser</li></ul>

### Safety tips

<u>Benzylamine</u> <ul style="list-style-type: none"><li>• H302+H312 H314</li><li>• P280 P301+P330+P331 P304+P340 P309+P310</li><li>• HAZARD!!</li></ul> 	<u>Hydrochloric acid, conc.</u> <ul style="list-style-type: none"><li>• H314 H335</li><li>• P280 P301+P330+P331 P305+P351+P338 P309+P310</li><li>• HAZARD!!</li></ul> 
<u>Ethyl alcohol:</u> <ul style="list-style-type: none"><li>• H225</li><li>• P210 P243 P280</li><li>• HAZARD!!</li></ul> 	<u>Potassium cyanate</u> <ul style="list-style-type: none"><li>• H302</li><li>• P301+P312</li><li>• ATTENTION!!</li></ul> 

## Reaction equation

Creation of a urea derivative using potassium cyanate (similar to the synthesis of urea by Wöhler)



## Experimental procedure

- In a 500 mL multiple neck flask solve 26.8 g benzylamine in 150 mL of water
- By adding of approx. 20 mL of conc. hydrochloric acid neutralize the mixture (verify by using pH-paper)
- After that add drop wise a solution of 100 mL water and 20.3 g potassium cyanate within 15 minutes, then reflux the mixture for 45 minutes
- Cool to 20° C und stir for 10 minutes, holding the temperature
- Suction-filter the recrystallized product, neutrally wash it three times with 30 mL water each, every time press off strongly
- Recrystallize the raw product using activated carbon from 180 mL mixture of water and ethyl alcohol (1:1)
- Cool the filtrate to 20°C and stir for 10 minutes at that temperature
- Suction-filter the product sharply and dry to mass consistency at 105°C

## Waste disposal:

- Dispose of the mother liquor in the container for acid solvents

## Analysis:

- Calculate the yield of product regarding benzylamine in grammes and percentage of theory

## Preparation list

### Chemicals:

- Benzylamine 26.8 g
- Hydrochloric acid , conc. approx. 20 mL
- Potassium cyanate 20.3 g
- Ethyl alcohol approx. 90 mL
- Activated carbone
- Water, dist.

### Tools:

- 500 mL multiple neck flask
- pH-paper
- Lifting platform
- Beaker glasses
- Funnel for liquids
- Measuring cylinder (2x 50 mL)
- Dropping funnel
- Glass stirrer
- Solid matter funnel
- Thermometer with ground joint
- Clamps and screwed joints
- Heating basket
- Stirring motor with stirrer und stirring locking
- Cabinet dryer
- Drying oven
- Analysis balance
- Reflux condenser

