Production of Aniline from Nitrobenzene and Hydrogen

Background:

Aniline, also know as amino benzene or benzeneamine, is an aromatic amine with the formulae $C_6H_5NH_2$. It is mainly used as a raw material in the production MDI, an intermediate in polyurethane manufacture. MDI production alone accounts for over 95% pf world amine consumption. Aniline is also used as an intermediate for dyes and pigments, explosive, agricultural chemicals and pharmaceuticals.

Flowsheet description:

The flowsheet simulates the production of Aniline from Nitrobenzene with addition of Hydrogen. The feed contains 25% Nitrobenzene and 75% Hydrogen. The feed is at conditions of 600K temperature and 101325 Pascal Pressure. The feed is sent to a conversion reactor where the conversion of the reaction is 99.9%. Because of the conversion the product stream consists of 66% of water and 33% of Aniline with approx. 1% of reactants. The product is then passed through a cooler to cool down up to 300K. The cooled product is than sent through a Distillation column from which water is removed as distillate and 99% pure Aniline is obtained from the bottom.

Objects used:

1. Material stream
2. Energy stream
3. Conversion reactor
4. Cooler
5. Distillation Column

Results:

The result of the flowsheet is that we get 99% pure Aniline form the bottom of the Distillation column and due to the 99.9% conversion of the reactant we obtain 33% Aniline and 66% water in the product.