



ALDOLIZATION- CROTONIZATION OF PROPANAL

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Synthesis of 2-methylpent-2-enal

Synthesis by aldolisation-crotonisation of propanal.

The aim of this experiment is to investigate the aldolization-crotonization reaction of propanal. Clearly, we are looking to react molecules of propanal to obtain an aldehyde. One also seeks to obtain the best possible yield.

The synthesis is done in several steps:

First of all, 10mL of concentrated sodium hydroxide at 5% is introduced into a round-bottomed two-necks flask. Then 20g of propanal is slowly added. The reaction proceeds for about half an hour.

Following this, two distinct phases are obtained, namely an aqueous phase and an organic phase. It is very important to recover the organic phase since it contains the product that we want to synthesize.

However, some molecules of product remain in solution in the aqueous phase. That's why one carries out three washes with the diethyl ether of the aqueous phase, with an aim of obtaining the best possible yield. Once the organic phase is reconstituted, it is washed twice with saturated salt water in order to remove the last impurities. Then the organic phase is dried with magnesium sulphate to remove all traces of water. Finally the organic solvent, in our case diethyl ether, is removed with the rotary evaporator.

Nevertheless, the evaporation of the solvent gave me some trouble ! Indeed, the desired product and the solvent are two liquids which have very different boiling temperatures, namely 35°C for the solvent and 136°C for the product. Logically, we expected the solvent to evaporate at 40°C and the product to remain in the flask. But the rotary evaporator was set at too low a pressure, and the design of the machine prevented us from setting it optimally. So I was surprised to find my flask empty... The solvent and the product had evaporated because of the too low pressure.

So I recovered the "waste round-bottomed flask" which I treated and purified in order to find my product.

Conclusions

To put it in a nutshell, the synthesis of 2-methylpent-2-enal was a success despite the incident of the rotary evaporator. Indeed, after all the treatments, I obtained 13.46g of product which represents a yield of 67.3%. In fact, the yield of this experiment doesn't really matter since it allowed us, above all, to assimilate the principle of aldolization-crotonization.