

# Two industrial examples of coupling experiments and simulations for increasing quality and yield of distilled beverages

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## abstract

The aim of this study was to check the ability of ProSim® software to model both continuous and batch distillations of two specific industrial units in order to obtain both a better understanding of the behaviour of aroma volatile components and a tool to optimise the still's operation. Simulations of multistage continuous distillation to produce neutral spirit from raw alcohol and of batch distillation to produce bitter orange distillate from bitter orange peelsmacerate were carried out with ProSimPlus and BatchColumn software. Simulations were compared with distillations performed in two industrial plants. For each case, the industrial plants were studied to determine all the operating parameters and the behaviour of certain compounds selected for their high concentration or quality impact. Then, the NRTL and Henry's law thermodynamic models were chosen. Simulation results of particular compositions of the selected compounds in the different extractions were analysed and compared with experimental measurements. Simulations represented faithfully the behaviour of compounds in the industrial plants. Therefore, it was possible fortwo totally separated cases to illustrate the interest of simulation software; for neutral spirit production to determine new operation set points in order to maximise productivity and improve quality for neutral spirit production and for bitter orange distillate production, to explain the choice of different cuts and the role of the presence of peels during distillation.

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