

Modeling and Monitoring the Experimental Implant for Measuring the Ethanol Concentration

Erinda Piluri¹, Dhurata Premti²

¹General Directorate of Metrology, Albania

²Department of Industrial Chemistry, University of Tirana, Faculty of Natural Sciences, Albania

Abstract- In this set of experiments we have tried to monitor a system of three reactors placed in series through experimental measurements of the ethanol concentration, temperature, flow and pressure at the outlet of system. We compared the results when the system has different metallic tubes used between vessels. For each set of experiments, we have used tubes with 6 and 8 mm diameter because they influence the pressure drop in our system.

Keywords- Continuous system, Ethanol concentration, flow, pressure and temperature parameters.

I. INTRODUCTION

The objective of this experimental work is to determine the concentration of ethanol in a system and to study the parameters affecting it. An important part are also the factors that are influencing the calibration solution. We can mention the physical and chemical properties of each component; the interval of ethanol concentration on the solution and the ability to work and change the parameters in the solution (temperature, pressure, flow).



FIGURE 1: System for monitoring the ethanol concentration.

II. RESULTS

In this set of experiments we have tried to monitor a system of three reactors placed in series through experimental measurements of the ethanol concentration, flow, pressure and temperature at the outlet of system. We compared the results when the system has different metallic tubes used between vessels. For each set of experiments, we have used tubes with 6 and 8 mm diameter. The gas flow was kept from 10 to 20 L/min and temperature 34 °C. After receiving all the values from the experiments we had these results:

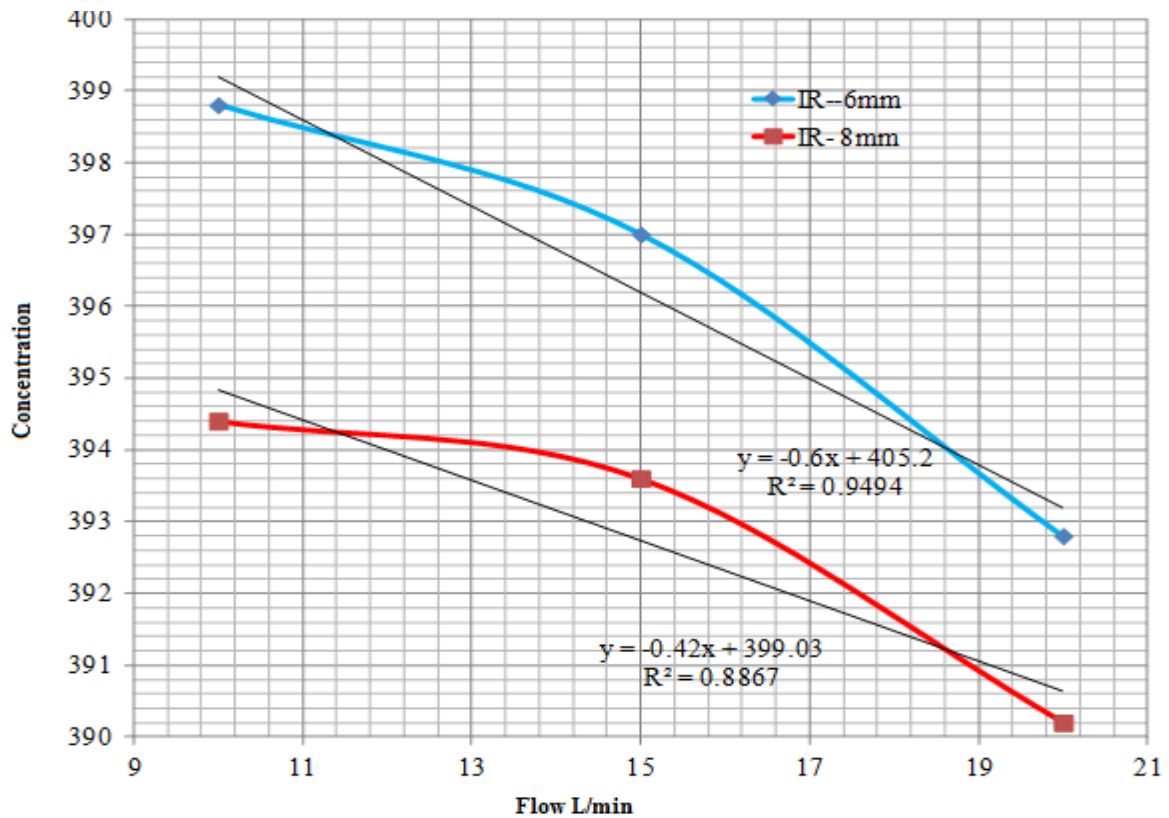


FIGURE 2: Graphic presentation of flow dependency from concentration with 6 and 8 mm connectors

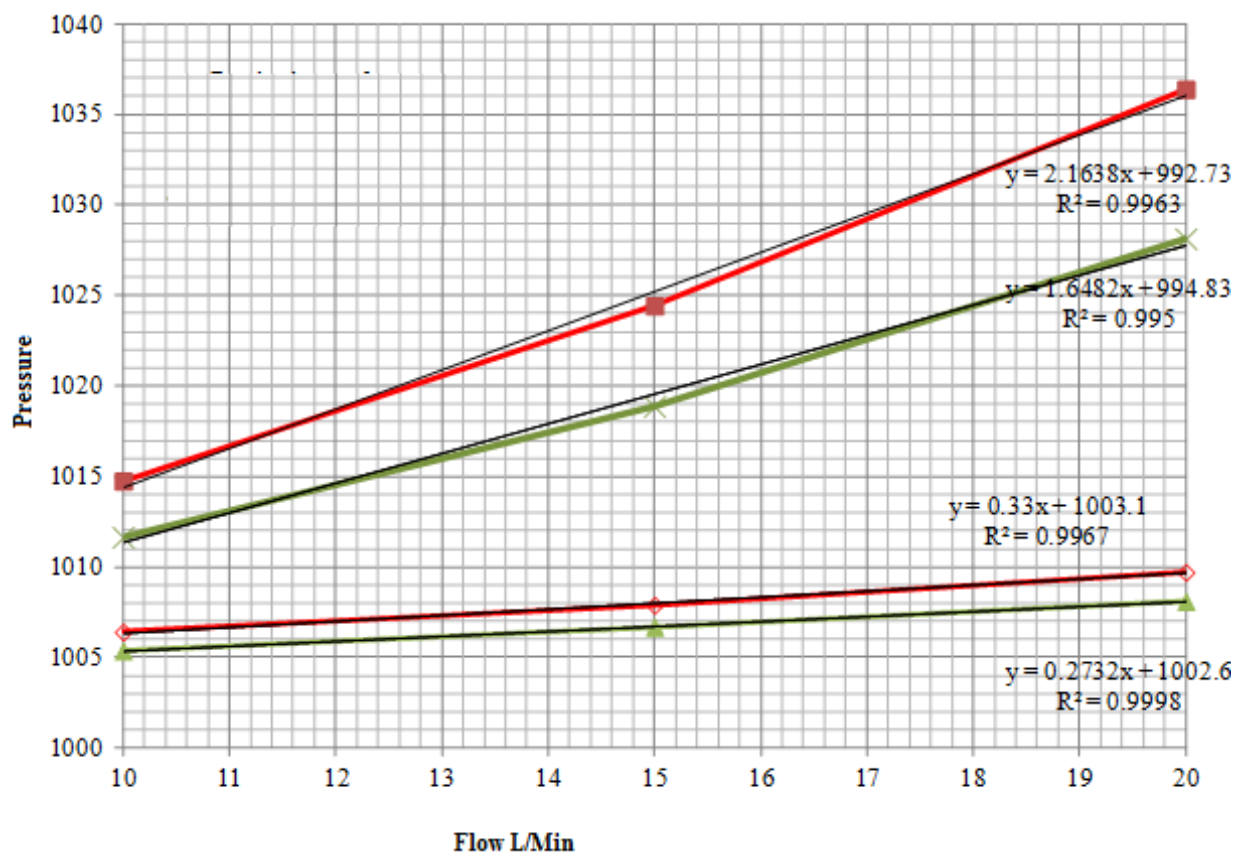


FIGURE 3: Graphic presentation of flow dependency from pressure with 6 and 8 mm connectors

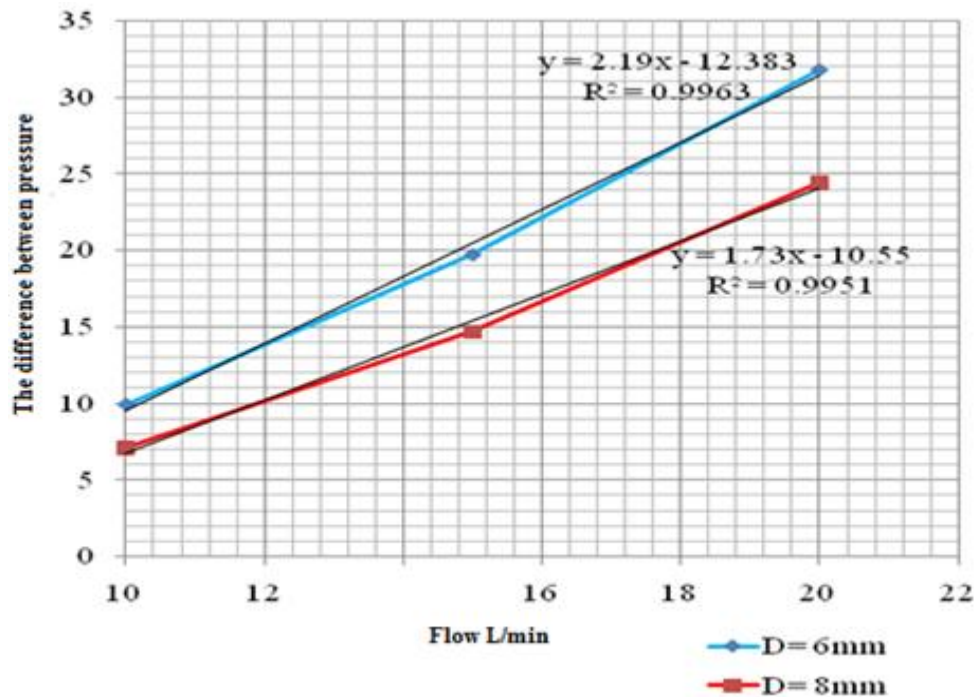


FIGURE 4: Graphic presentation of flow dependency from the difference of pressure with 6 and 8 mm connectors

III. CONCLUSION

We studied the dynamic model that gives the correlation of ethanol concentration with parameters affecting thermodynamic equilibrium. The parameters:

- **Temperature** – The increase of the temperature, rise an increase of ethanol concentration in the gaseous phase with a fixed ratio of ethanol separation in the gas on the solution.
- **Pressure**- The increase of the pressure drop difference results reduces the decrease in the gas phase concentration.
- **Flow rate**- The increase of the flow rate of gas reduces the ethanol concentration in gaseous phase.

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