First Line of the Title
Second Line of the Title

Nuclear Engineering – Politecnico di Milano

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Course: Or other indication
Academic Year: Or some time indication

ABSTRACT

Here write you Abstract.

Key-words: Key, Words, Here

NOMENCLATURE

Type A

x	X quantity

Type B & Misc

y	Y quantity

CONTENTS

1 INTRODUCTION

1.1 Context

1.2 Objectives

We have to determine the breakthrough curve of a knwon step injection of a tracer substance in a column of porous medium. The tracer is a non-reactive solute, and the column is saturated with water. The experiment will help us understand the transport properties of the porous medium.

2 THEORETICAL BACKGROUND

2.1 Relevant Equations and Models

3 EXPERIMENTAL SETUP

3.1 Materials and Instruments

The column itself is quite small for didatic pupropes (we want the experiment to be done in a reasonable time). Is 19.5cm high and 1cm in diameter. It is filled with spherical quartz of knwon porosity. The column is saturated with water which is flowing through the system with a XXX pump. The deisred flow can be set on the pump but the real flow rate is slowered by the resistance of the pipes and porous medium, the real flow rate has to be determined by the reading of a scale on top of which there is a beaker that collects the exiting water from the column. After exiting the column the flow goes through a spettrofotometer that measures the trasmittance of the water. The trasmittance of the flow is compared to the one of a reference sample of clean water to get a relative value. The flow is controlled by 3 valves that escure continuous flow of the two substances (clean water and water+tracer), while only one can actually pass through the column. The tracer has to be non reactive for the pupropes of this experiments, so the solution is NaNO3 in water. The whole experimental setup and the data gathering is controlled with Labview on a computer, the spettrofotometer and the scale are connected through serial interfaces. The device is set to get a reading every second.

3.2 Procedure

Trough labview the Procedure is programmed to be run automatically. The experiment is programmed to run the water for X minutes before injecting the tracer solution for 480 seconds, then the flow is switched back to water and the cycle repeats. (We only need to observe one cycle). We observe the relative trasmittance of the flowing solution compared to the one of clean water, the absorbance is also calculated in the software by Lambert-Beer law.

4 RESULTS

4.1 Data Collection

We obtained a tabe with the reading istant by instant.

4.2 Data Processing

5 DISCUSSION

5.1 Interpretation of Results

5.2 Sources of Error

6 CONCLUSION