WATER DESALINATION WITH ELECTRODIALYSIS

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INTRODUCTION

The scarcity of fresh water makes it necessary to discover new methods for saline water desalination, in order to make the process more efficient and cheaper.

One of these methods is electrodialysis, which uses an electric current as a source for the movement of ions and consequent production of a diluted solution and a concentrated solution.

METHODOLOGY

Analyse how the different parameters: linerar velocity, electrical current density and initial salt concentration, influence on the different results of the ED process: salt removal, specific energy consumption (SEC) and energy efficiency.

Each one of the experiments was repeated two times, the initial electroconductivity and the diluate salt electroconductivity were measured (representing the salt concentration), and the values of the volumetric flow (representing the linear velocity), of electrical current density and of voltage were registered in an excel sheet, so that the outputs could be calculated.

RESULTS
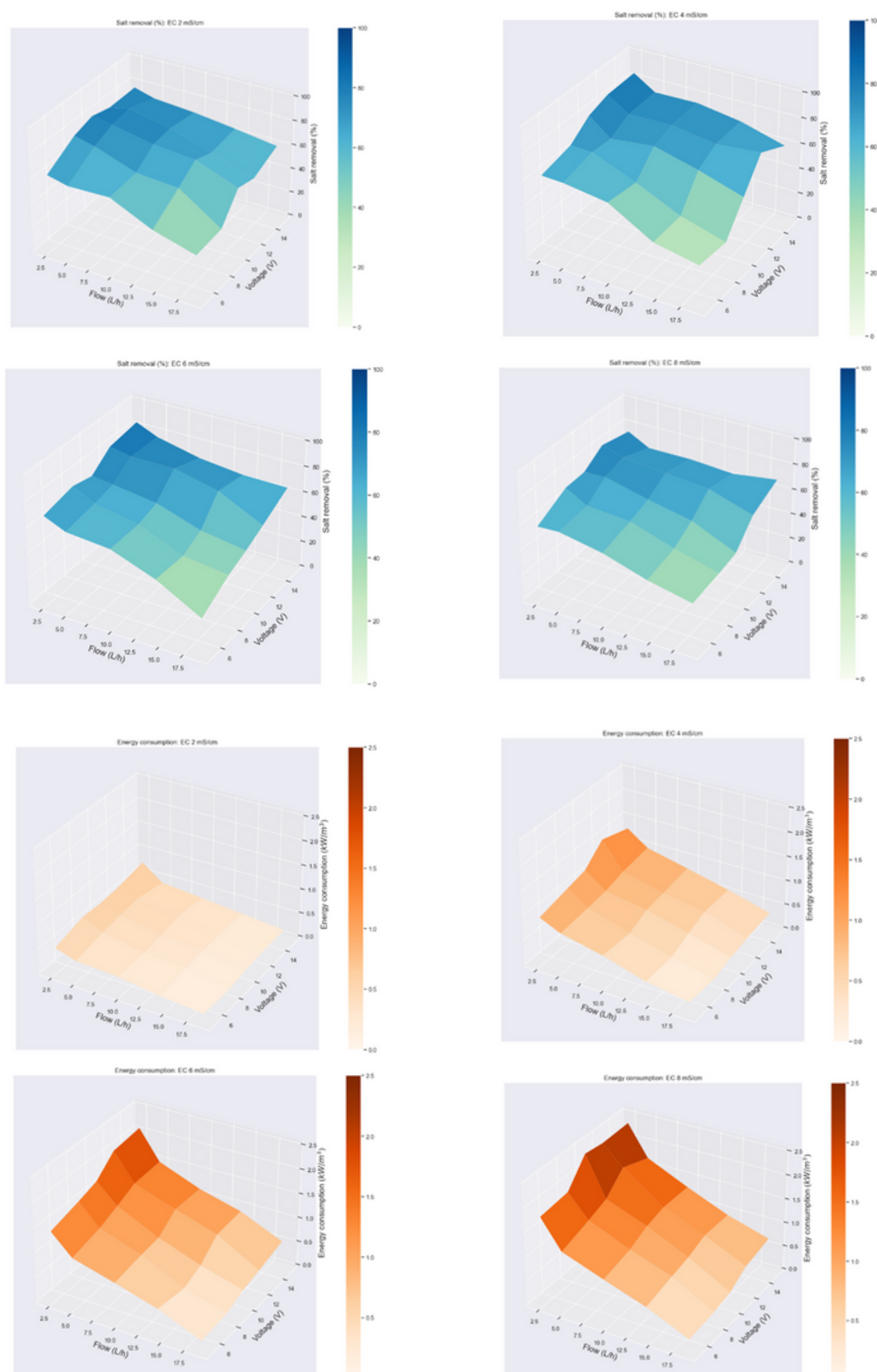
DISCUSSION

The voltage, that represented the electric current density, influenced the outputs:
- Higher voltage leads to higher salt removal;
- Higher voltage leads to higher values of SEC;
- Higher voltage leads to lower energy efficiency.

The volumetric flow, that represented the linear velocity, influenced the outputs:
- Higher volumetric flow leads to lower salt removal;
- Higher volumetric flow leads to lower values of SEC;
- The volumetric flow had no direct influence on the energy efficiency.

The electriconductivity, that represented the salt concentration, influenced the outputs:
- Higher initial electriconductivity leads to higher values of SEC;
- The initial electriconductivity had no direct influence on the salt removal and on the energy efficiency.

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