



Master Thesis

Control doping of Organic Electrochemical Transistors (OECTs) to Tune Threshold Voltage

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1 Introduction

The chapter should broadly contextualize your research and motivate your work.

2 Background

2.1 Organic Semiconductors

2.1.1 Electronic structure

Since inorganic semiconductors' band theory does not take into consideration the Coulomb and exchange electron-electron interaction, which play a major role in organic semiconductors, it is necessary to add new theoretical approaches. On one hand, the transport properties are better described in terms of a hopping mechanism and the optoelectronic properties are better described by the molecular orbital picture.

2.1.2 Doping mechanism

Molecular doping

Use of small molecules

Electrochemical doping

Important in OECT physics covered in a later section.

2.2 Organic Mixed Ionic/Electronic Conductors (OMIECs)

2.2.1 A widely used material: PEDOT:PSS

2.2.2 Engineering of semiconducting polymers

2.3 Organic Electrochemical Transistors (OECTs)

2.3.1 Device physics

2.3.2 Operation modes

2.3.3 Important figures of merit

Transconductance

Volumetric capacitance

2.3.4 Stability requirements

2.3.5 Building block of neuromorphic and bioelectronic applications

3 Experimental methods

3.1 Materials

3.2 Equipment

3.3 Software

3.4 Photomasks

3.5 Experimental procedures

4 Results

5 Conclusion and Outlook

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A Appendix I

Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language. Hello, here is some text without a meaning. This text should show what a printed text will look like at this place. If you read this text, you will get no information. Really? Is there no information? Is there a difference between this text and some nonsense like "Huardest gefburn"? Kjift – not at all! A blind text like this gives you information about the selected font, how the letters are written and an impression of the look. This text should contain all letters of the alphabet and it should be written in of the original language. There is no need for special content, but the length of words should match the language.

B Appendix II

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