

Increasing Functionality of Tin Oxide Nanowires

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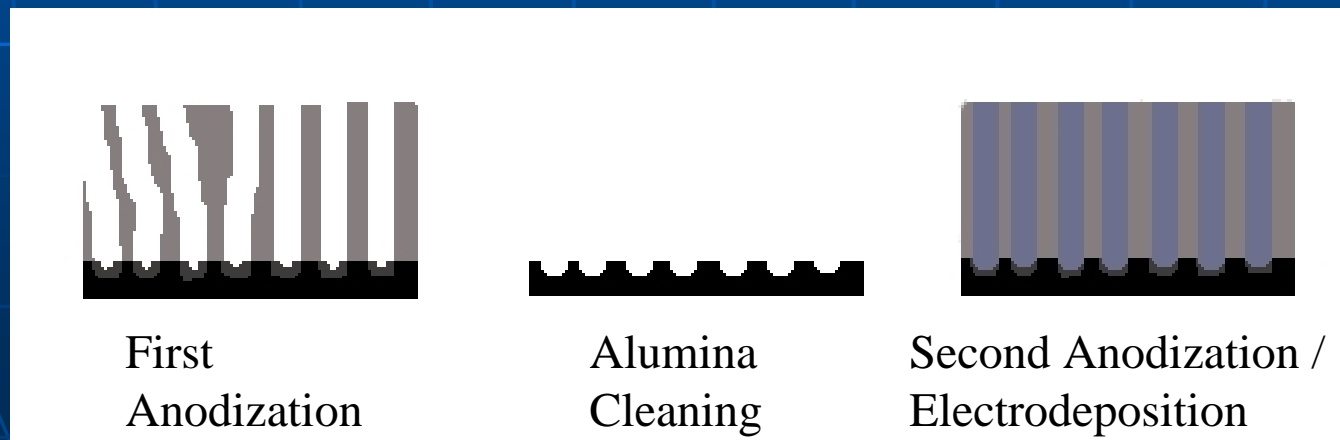


Overview of project

- Use state of the art nanowire fabrication techniques to make tin oxide nanowires
 - Increase functionality of nanowires by applying different materials to surface of wires
 - Use the properties of the new material coatings in conjunction with knowledge of nanowire current behavior to classify different chemical sensing abilities of wires
- Ultimate Goal
 - Place multiple chemical sensors in centralized location to detect various chemicals simultaneously

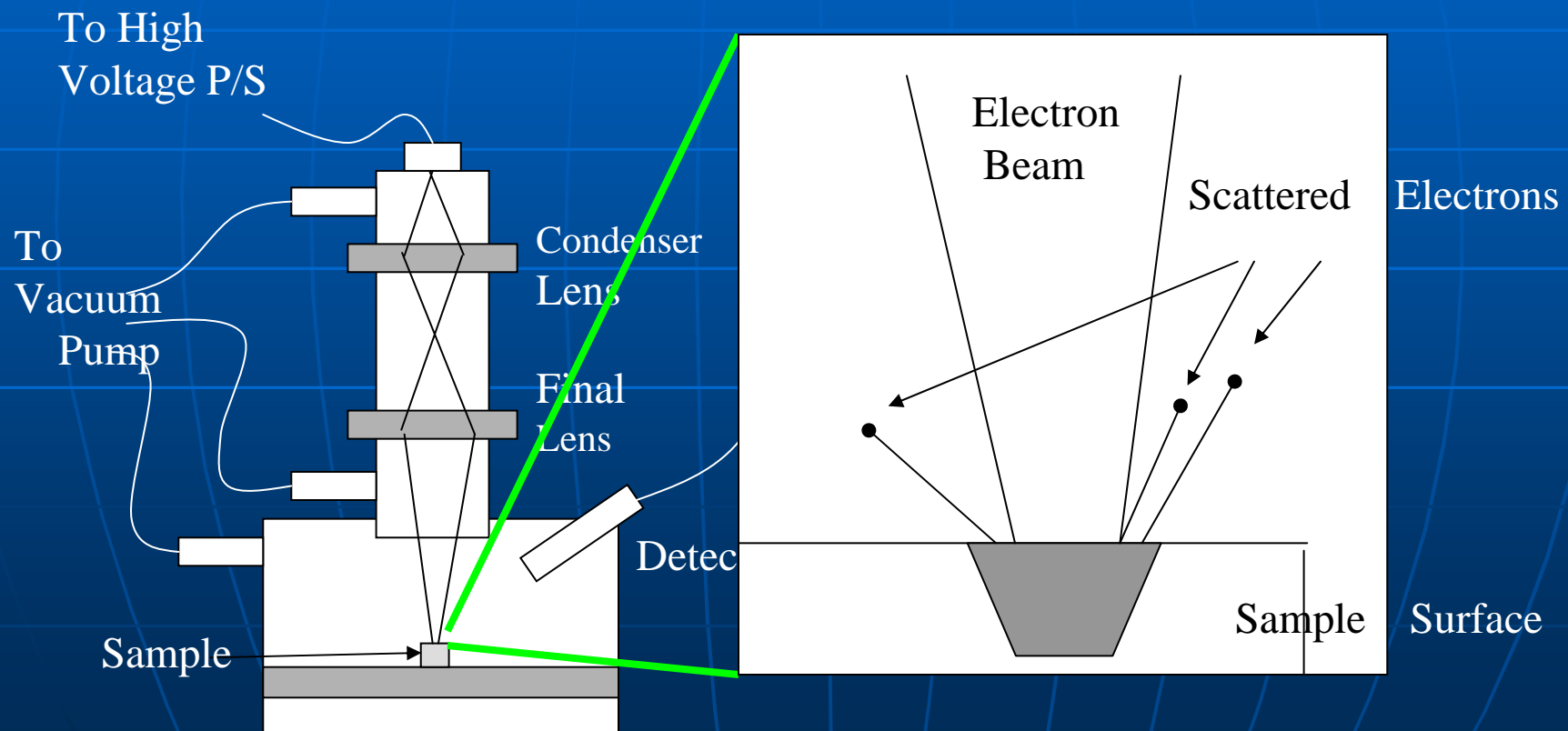
Nanowire Fabrication

- Fabrication of tin nanowires using one of two nanowire fabrication techniques
- VLS (Vapor/Liquid/Solid) Method
- PAO (Porus Aluminum Oxide) template Method

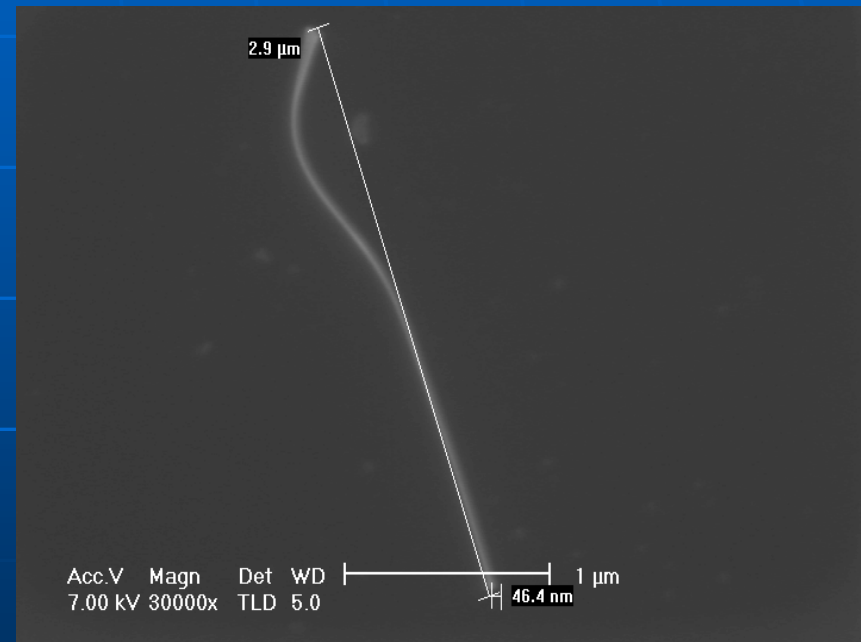
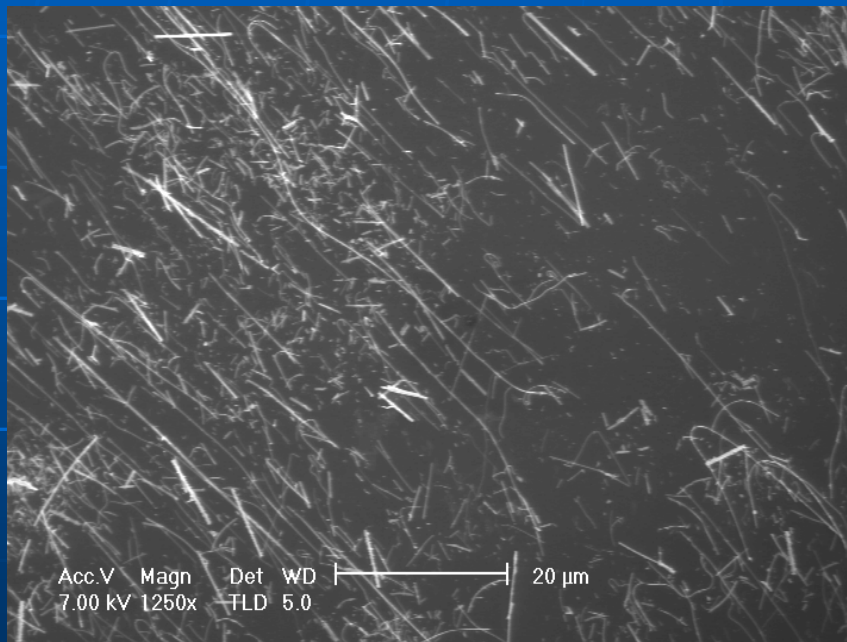


How the Wires are Checked

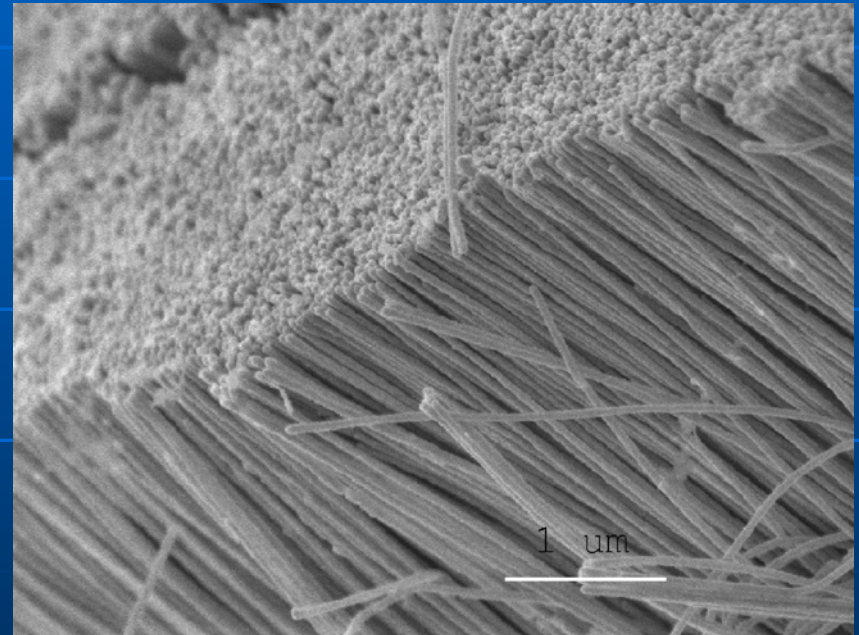
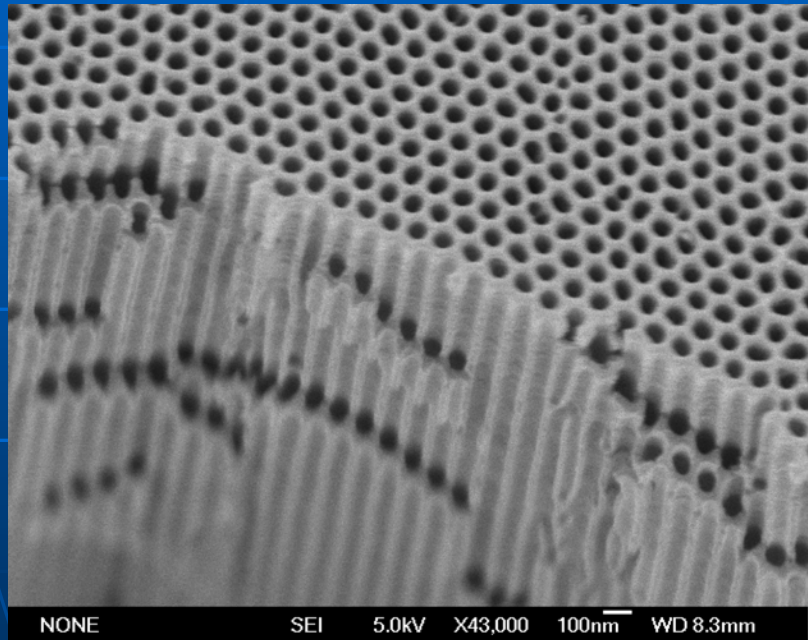
- Scanning Electron Microscope (SEM)



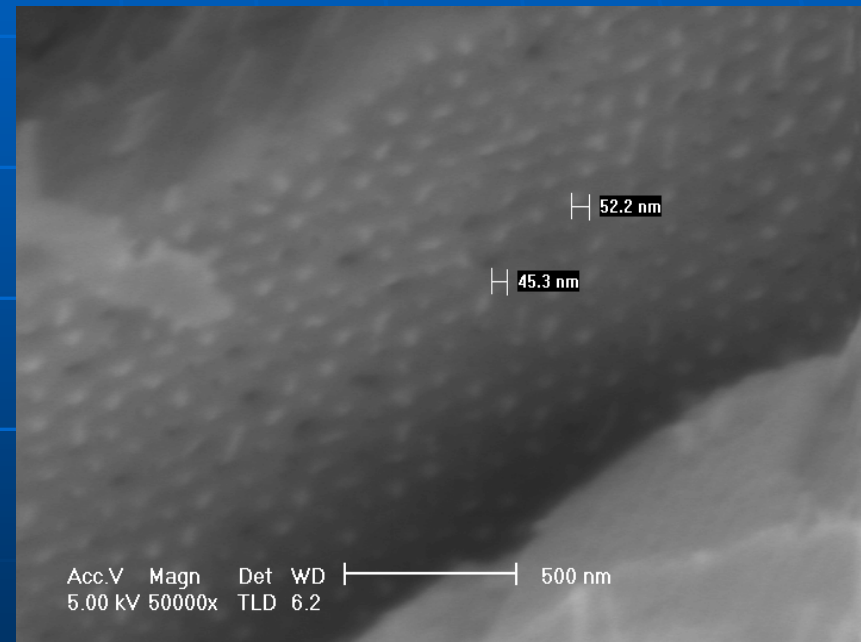
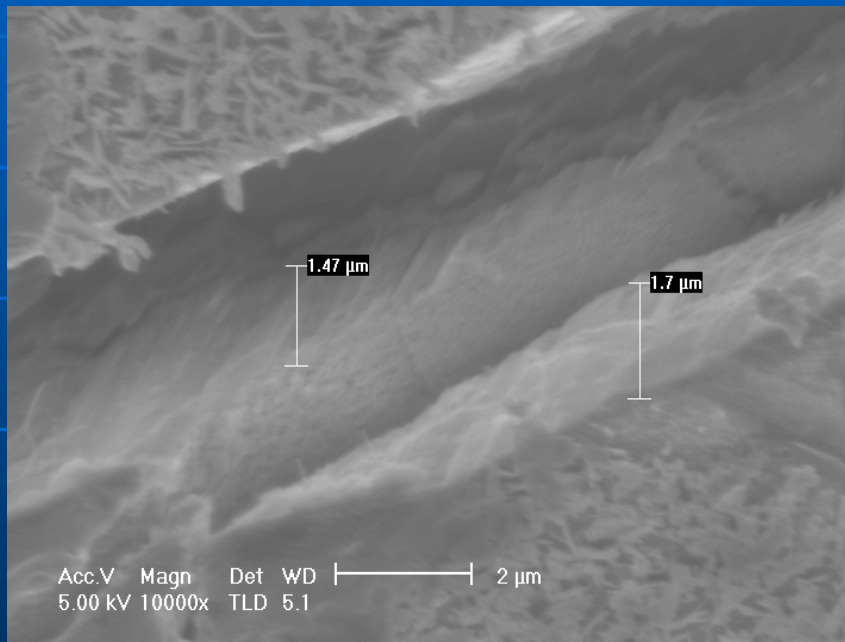
My Vapor Liquid Solid Nanowires



Ideal Porus Aluminum Oxide Nanowires



My Porous Aluminum Oxide Nanowires

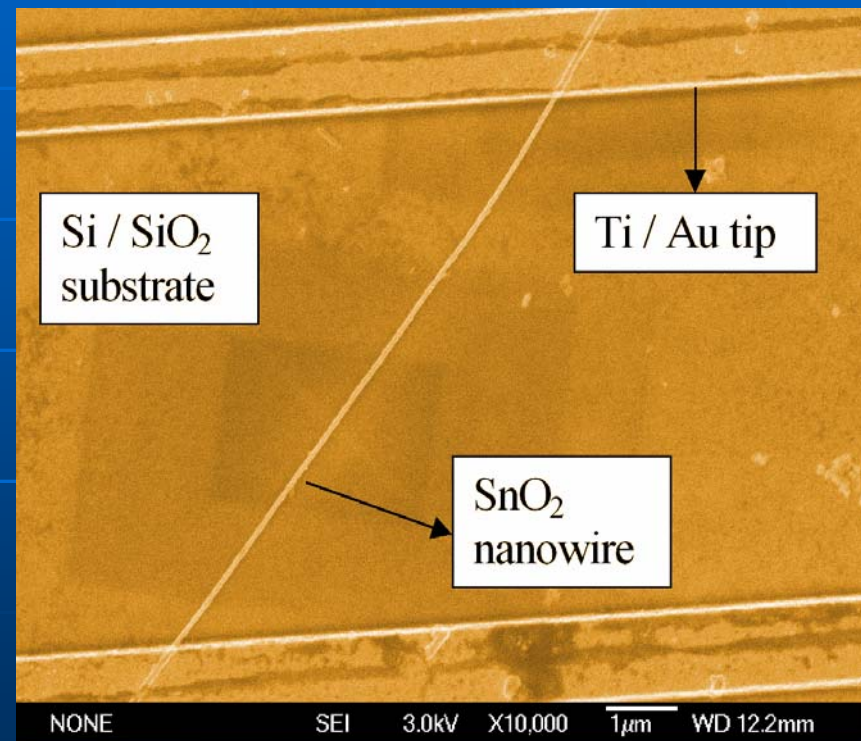


Personal Achievements (to Date)

- Nanowire fabrication techniques
 - Vapor/Liquid/Solid
 - Porus Aluminum Oxide
- SEM operation and control
- Gas Sensing Chamber Operation

Remaining Steps for Gas Sensing

- Nanowire functionalization
 - Placement onto Silicon Oxide Substrate
 - Adding electrical contacts
 - Running conductance test with different gases

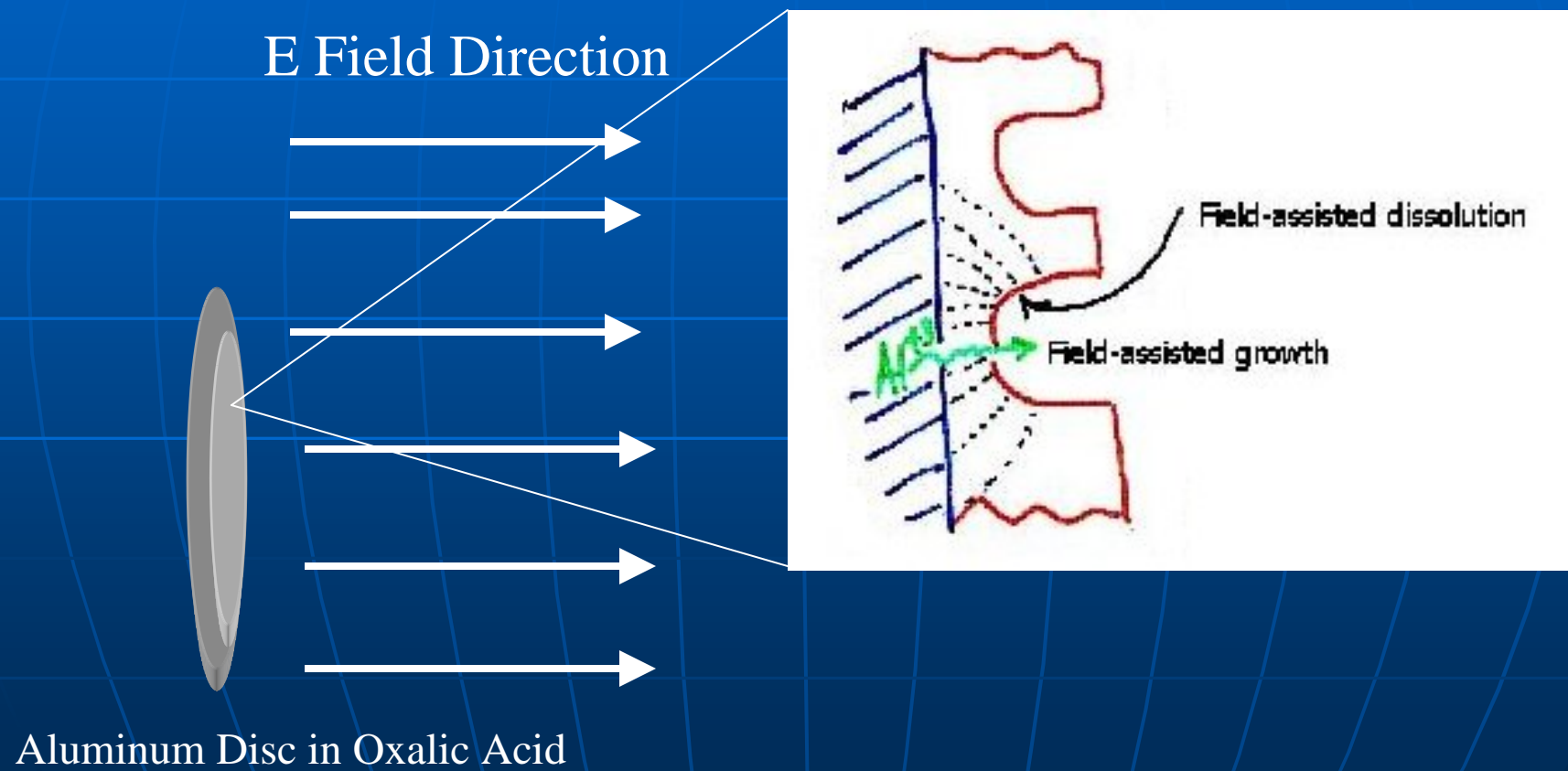


Acknowledgements

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Alumina Formation



How Tin Oxide Sensing Works

Oxygen adsorbs reducing its conductance. CO reacts with the adsorbed O ions to form CO_2 , returning the electrons to the bulk.

