



All



ADVANCED SEARCH

ISBN: 978-1-6654-8425-1

Conferences > 2022 International Conference...

# Ion Sensitive Field Effect Transistor as a Bio-compatible Device: A Review

Publisher: IEEE

Cite This

PDF

Sankararao Majji ; Chandra Sekhar Dash ; Asisa Kumar Panigrahy All Authors

113 Full Text Views



## Alerts

Manage Content Alerts

Add to Citation Alerts

### More Like This

CMOS Open-Gate Ion-Sensitive Field-Effect Transistors for Ultrasensitive Dopamine Detection  
IEEE Transactions on Electron Devices  
Published: 2010

Chemical bionics - a novel design approach using Ion Sensitive Field Effect Transistors  
2008 IEEE Biomedical Circuits and Systems Conference  
Published: 2008

Show More

Abstract



Download PDF

Document Sections

- I. Introduction
- II. ISFET as a Sensing Element
- III. Summary

**Abstract:**The ion-sensitive field-effect transistor (ISFET) is one of the most sensitive and adaptable sensors available, and it may be employed in modern complementary metal-oxide... **View more**

#### Metadata

**Abstract:**  
The ion-sensitive field-effect transistor (ISFET) is one of the most sensitive and adaptable sensors available, and it may be employed in modern complementary metal-oxide semiconductor (CMOS) techniques. As a result of its tiny size, low power consumption, and compatibility with industry-standard complementary metal oxide semiconductor (CMOS) technologies, potentiometric sensors like ISFETs are gaining appeal among sensor scientists and industrialists. These past decades have been broken down into three distinct time periods, which is described in detail in this paper to give an overview of what has been accomplished in the field over this. This work, briefly reviews about history, characteristic of the ISFET, and further discussion is performed about vivid applications of the ISFET.

### Authors

Figures

References

Keywords

Metrics

More Like This

**Published in:** 2022 International Conference on Electronics and Renewable Systems (ICEARS)

**Date of Conference:** 16-18 March 2022

**INSPEC Accession Number:** 21688608

**Date Added to IEEE Xplore:** 13 April 2022

**DOI:** 10.1109/ICEARS53579.2022.9752072

► **ISBN Information:**

**Publisher:** IEEE

**Conference Location:** Tuticorin, India

---

Sankararao Majji  
Department of ECE, Centurion University of Technology and Management,  
Odisha, India

---

Chandra Sekhar Dash  
Department of ECE, Centurion University of Technology and Management,  
Odisha, India

---

Asisa Kumar Panigrahy  
Department of ECE, Gokaraju Rangaraju Institute of Engineering & Technology,  
Hyderabad, India

---

## Contents

### I. Introduction

The ISFETs are comparable to MOSFETs with the former devoid of the gate material. The gate insulator which is the sensing layer of an ISFET is in direct contact with the electrolyte and requires a reference electrode to complete the gate to source circuit. The working of an ISFET may be explained effectively by the site binding theory and the electrical double layer theory. The ability of an ISFET device to be integrated with biologically active material helped it to explore into the field of biosensors [1]. It was noticed that ISFETs might be conveniently employed in conjunction with enzymes and other biological membranes generating an Enzyme Field Effect Transistor (ENFET). Since then, various different enzymes are being employed for different ENFETs. The enzymes are specific to a certain analyte. The enzyme Cytochrome P450 monooxygenase used in this work has the specificity of oxidizing n-hexadecane into n-hexadecanol. This enzyme has the potential of bio-monitoring as it oxidizes hydrocarbon which is an effective instrument in oil industry helping in monitoring environment deterioration by the oil spill [2].

---

### Authors

Sankararao Majji  
Department of ECE, Centurion University of Technology and Management,  
Odisha, India

---

Chandra Sekhar Dash  
Department of ECE, Centurion University of Technology and Management,  
Odisha, India

---