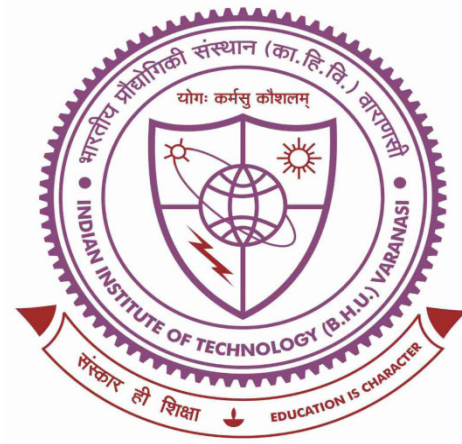


*Development of Novel Pseudocapacitive Electrodes
for fabrication of Hybrid Supercapacitor and their
performance study through Machine Learning
methods for the Application in Biomedical devices*



A thesis submitted in partial fulfillment for the
Award of Degree

Doctor of Philosophy

By

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ROLL No: 19021009

YEAR: 2024

*Dedicated to my Beloved Parents and
Family*



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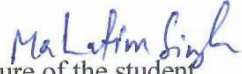
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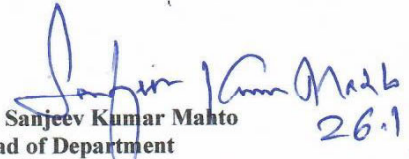
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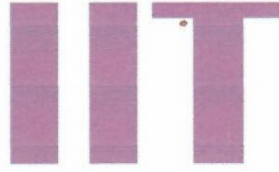

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Table of Contents

List of Figures	xii
List of Tables	xviii
List of Abbreviations	xix
Preface.....	xx
Chapter 1 : Introduction and Literature Review	
1.1 Need for high Energy Storage device in Medical application	3
1.2 Types of devices used in Biomedical applications	5
1.2.1 Medical application using External devices	6
1.2.2 Implantable Medical Devices	7
1.3 Power requirement of Biomedical devices	8
1.4 Basic Requirements for Biomedical Energy Storage device	9
1.5 Existing Energy Storage Solutions	11
1.5.1 Primary Lithium-metal batteries for Biomedical Implants	11
1.5.2 Secondary (Rechargeable) Batteries.....	12
1.5.3 Other Batteries	15
1.6 Limitations of existing systems and new requirements	16
1.6.1 Understanding the problem	18
1.6.2 Electrochemical Supercapacitors	19
1.6.3 Electrochemical double-layer capacitors	20
1.6.4 Pseudocapacitors	21
1.6.5 Hybrid battery-type supercapacitor	21
1.7 Electrode materials	23
1.7.1 Carbon-based Electrode materials	25
1.7.2 Metal Oxides Composite Electrodes	25
1.7.2.1 Ruthenium dioxide (RuO₂)	26
1.7.2.2 Manganese dioxide (MnO₂)	27
1.7.2.3 Nickel oxide (NiO) & nickel hydroxide (Ni(OH)₂)	28
1.7.3 Conductive Polymers Composite Electrodes	30
1.8 Our Electrode development approach	30

1.8.1 Transition metal oxalate-based electrodes	31
1.8.2 Metal phosphate-based materials for high-performance supercapacitors ...	32
1.8.3 Existing electrode materials and their energy storage capacity	33
1.8.4 Machine learning-inspired modelling of electrode	34
1.9 Objective	36
References	37
Chapter 2 : Experimental Techniques	
2.1 Overview	53
2.2 Materials Synthesis techniques	53
2.2.1 Solid-state or Ceramic method	54
2.2.2 Sol-gel auto combustion method	54
2.2.3 Co-precipitation method	55
2.3 Material Characterization Techniques	56
2.3.1 Powder X-Ray Diffraction (XRD)	57
2.3.2 Phase Confirmation and Crystal Structure Studies by Powder X-Ray diffraction	58
2.3.3 High-Resolution Scanning Electron Microscope (HR-SEM)	60
2.3.4 High-Resolution Transmission Electron Microscope (HR-TEM)	63
2.3.5 Thermogravimetric analysis (TGA)	64
2.3.6 Fourier transform infrared (FTIR) spectroscopy	65
2.3.7 UV-Visible Spectrophotometer	66
2.3.8 Raman Spectroscopy	67
2.3.9 X-ray photoelectron spectroscopy (XPS)	69
2.3.10 BET (Brunner-Emmett-Teller theory) surface area measurement	70
2.4 Electrochemical Measurements	71
2.4.1 Electrode fabrication	71
2.4.2 Cyclic Voltammetry (CV)	72
2.4.3 Galvanostatic Charge-Discharge (GCD)	73
2.4.4 Electrochemical Impedance Spectroscopy (EIS)	74
2.4.5 Chemical Kinetic for pseudocapacitors from Cyclic voltammetry (CV) curve	75

2.5 Machine Learning (ML) driven study	77
2.5.1 Workflow of machine learning	78
2.5.1.1 Data collection	78
2.5.1.2 Feature engineering	79
2.5.1.3 ML model selection	79
2.5.1.4 ML model evaluation	80
References.....	81

Chapter-3 : Framework structured $Ce_2(C_2O_4)_3 \cdot 10H_2O$ as a Pseudocapacitive electrode of Hybrid (Asymmetric) Supercapacitor (HSC) for Large Scale Energy Storage Applications

3.1 Introduction	87
3.2 Experimental Procedure	87
3.2.1 Synthesis	87
3.2.2 Characterizations	88
3.2.3 Preparation of Electrode	88
3.3 Results and Discussion	89
3.3.1 Electrochemical Studies	95
3.3.2 Two electrode tests in Full cell Hybrid supercapacitor mode	101
3.4 Conclusions	105
References.....	107

Chapter 4 : Combustion Synthesized $KNiPO_4$: A Non-Toxic, Robust, Intercalating Battery-type Pseudocapacitive Electrode for Hybrid Supercapacitors as a Large-scale Energy Storage Solutions

4.1 Introduction	111
4.2 Experimental Procedure	111
4.2.1 Synthesis of $KNiPO_4$	111
4.2.2 Materials characterization	112
4.2.3 Electrode preparation	113
4.3 Results and discussion	113

4.3.1 Electrochemical Studies	117
4.3.2 Full cell measurements in Hybrid Supercapacitor (HSc) Mode	124
4.4 Conclusion.....	127
References.....	130

Chapter 5 : Machine learning-based approach for screening of supercapacitor electrode materials and its performance evaluation

5.1 Introduction	137
5.2 Dataset description	139
5.3 Methodology	141
5.3.1 Machine Learning Algorithms	141
5.3.1.1 Multilayer Perceptron (MLP)	141
5.3.1.2 Random Forest	142
5.3.1.3 Random Committee	143
5.3.1.4 Multiclass Classifier	143
5.3.1.5 Random Tree	144
5.3.2 Parameters to validate the models	145
5.3.2.1 Cohen’s kappa or kappa statistic (κ)	145
5.3.2.2 Mean absolute error (MAE)	145
5.3.2.3 Root mean square error (RMSE)	146
5.3.2.4 Relative absolute error (RAE)	146
5.3.2.5 Precision	146
5.3.2.6 Recall	146
5.3.2.7 F ₁ -Score	147
5.3.2.8 Accuracy	147
5.3.3 Feature selection and data balancing	147
5.3.4 Electrochemical Experiment	149
5.3.4.1 Material Synthesis	149
5.3.4.2 Electrode Preparation	149
5.3.4.3 Electrochemical Testing	150
5.4 Results and discussion	150

5.4.1 Grade prediction model	150
5.4.2 Value prediction model	154
5.5 Summary	155
References.....	157
 Chapter 6 : Summary and Future scope	
6.1 Summary	161
6.2 Future Scope	164

LIST OF FIGURES

Figure No.	Figure description	Page No.
Figure 1.1	Proportion of PHCs and SCs in India without electricity supply	4
Figure 1.2	Electrification option for rural health clinic	4
Figure 1.3	Different types of Biomedical equipment	5
Figure 1.4	Power ranges of different Biomedical equipment	9
Figure 1.5	The configuration of a rechargeable Li-ion battery	14
Figure 1.6	Diagram illustrating a bio-fuel cell	15
Figure 1.7	Overview of energy storage devices	17
Figure 1.8	Advantage of supercapacitors over battery	19

Figure 1.9	The charge storage mechanism of EDLC	20
Figure 1.10	Schematic of pseudocapacitive systems identified by Conway	21
Figure 1.11	The fundamental configuration of the HSCs	22
Figure 1.12	Properties of active materials including carbon nanomaterials, conducting polymers, metal and metal oxides, and composites	24
Figure 2.1	Schematic representation of the three types of synthesis routes	53
Figure 2.2	Block diagram of solid-state synthesis process or Ceramic method	54
Figure 2.3	Block diagram sol-gel auto combustion synthesis process	55
Figure 2.4	Block diagram Co-precipitation synthesis process	56
Figure 2.5	Characterization techniques used	57
Figure 2.6	Schematic diagram of the incident and diffracted X-rays from the crystal	58
Figure 2.7	Rigaku, Miniflex II, Japan, XRD Set-up, IIT (BHU) Varanasi	59
Figure 2.8	Schematic diagram of the core component of SEM microscope	62
Figure 2.9	HR-SEM Instrument facility, ZEISS EVO 18 in CIFIC IIT (BHU) Varanasi	62
Figure 2.10	(a) Schematic diagram of core component of TEM microscope. Transmitted and diffracted electrons for (b) Bright field and (c) Dark field imaging in TEM	63
Figure 2.11	HR-TEM Facilities with EDAX spectrometer, IIT (BHU) Varanasi	64
Figure 2.12	TGA measurement system CIFIC, IIT (BHU) Varanasi	65
Figure 2.13	FTIR spectrometer CIFIC, IIT (BHU) Varanasi	66
Figure 2.14	Schematic diagram of UV-Visible spectrometer	67
Figure 2.15	Schematic diagram of Raman spectrometer	68
Figure 2.16	X-ray photoelectron spectroscopy (XPS), CIFIC. IIT(BHU)	69
Figure 2.17	BET (Brunner-Emmett-Teller theory), CIFIC. IIT(BHU)	70
Figure 2.18	Electrode picture for supercapacitor application	71
Figure 2.19	Conventional three electrodes setup used in electrochemical testing	73
Figure 2.20	Nyquist Plot for ionic solids (Z'' = imaginary impedance, Z' = real impedance)	74
Figure 2.21	Power-law dependence of the peak current on sweep rate for capacitive materials ($b= 1.0$) and typical battery-type materials (b	76

= 0.5). The “transition” area between capacitive and battery-type materials area is located in the range of $b = 0.5-1.0$.

Figure 2.22	Workflow of ML application	78
Figure 3.1	(a) Rietveld refined XRD profile of $Ce_2(C_2O_4)_3 \cdot 10H_2O$, (b) VESTA image of $Ce_2(C_2O_4)_3 \cdot 10H_2O$ (c) TGA of $Ce_2(C_2O_4)_3 \cdot 10H_2O$ in an N_2 atmosphere (inset shows the DTA plot) and (d) comparative XRD profile of $Ce_2(C_2O_4)_3 \cdot 10H_2O$ and final CeO_2 phase obtained after TGA study.	90
Figure 3.2	(a) FT-IR spectra of $Ce_2(C_2O_4)_3 \cdot 10H_2O$, (b) FT-Raman spectra of $Ce_2(C_2O_4)_3 \cdot 10H_2O$ before and after electrochemical testing, and (c) BET surface area measurement plot of $Ce_2(C_2O_4)_3 \cdot 10H_2O$	91
Figure 3.3	(a) HR-SEM image showing columnar shaped morphology of $Ce_2(C_2O_4)_3 \cdot 10H_2O$ powder, (b) shows the EDX image of $Ce_2(C_2O_4)_3 \cdot 10H_2O$ and (c-e) shows the elemental distribution of Ce, C, and O respectively in the sample.	93
Figure 3.4	(a) HR-TEM image at localized regions (i) lattice fringes shows with (ii) FFT and (iii) inverse FFT of (-111) plane showing d spacing (0.663 nm) of porous $Ce_2(C_2O_4)_3 \cdot 10H_2O$ and (b) shows calculated d spacing (0.663 nm) of (-111) plane (using gatan software).	94
Figure 3.5	Figure 3.5. XPS plot of $Ce_2(C_2O_4)_3 \cdot 10H_2O$; (a) full survey, (b) $Ce(3d)$ spectrum, (c) $C(1s)$ spectrum, and (d) $O(1s)$ spectrum	95
Figure 3.6	(a) Comparative Cyclic voltammetry plot of $Ce_2(C_2O_4)_3 \cdot 10H_2O$ and CeO_2 phase obtained after TGA study of the Oxalate, (b) Cyclic voltammetry plot of $Ce_2(C_2O_4)_3 \cdot 10H_2O$ at different scan rate and (c) plot of $\log(\text{peak current})$ vs square root of the scan rate for porous $Ce_2(C_2O_4)_3 \cdot 10H_2O$ electrode.	96
Figure 3.7	Electrodynamic characteristics of the $Ce_2(C_2O_4)_3 \cdot 10H_2O$ electrode; (a) b value plot of the linear relationship between $\log(\text{peak current})$ and $\log(\text{scan rate})$ at two different scan rate	98

regions, (b) plot of the power law of the charged state at a potential and discharged state at a potential, (c) contribution of diffusive and capacitive contribution at different scan rates

- Figure 3.8** (a) Comparative Charge/discharge curve of battery type $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ and CeO_2 at 1A/g (b) Charge/discharge curve of battery type $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ with different constant current (c) capacity performance of $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ at different constant current rates, and (d) EIS Nyquist plot and (e) EIS Bode plot of $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ electrode at 10 mV (AC) between 0.1 Hz and 100 kHz and (f) Capacitance retention and Coulombic efficiency porous $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ with 5000 cycles 100
- Figure 3.9** (a) Respective CV curves for activated carbon (AC) and porous $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ at 10 mV/s, (b) plot for Activated carbon // Porous $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ cell in ASC mode CV at different scan rates, (c) charge/discharge at different current rates of Activated carbon // Porous $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ (d) EIS at 10 mV (AC), (e) EIS Bode plot of AC// $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ cell at 10 mV (AC), (f) Capacitance retention and coulombic efficiency, and (g) comparative Ragone plot (power density vs. energy density) with two electrode cells((AC// $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$) in Hybrid supercapacitor mode. 103
- Figure 3.10** (a) A comparative XRD $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ powder sample before and after the Electrochemical study, (b) A comparative HR-SEM study of $\text{Ce}_2(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$ powder sample before and after the Electrochemical study. 105
- Figure 4.1** (a) XRD Rietveld refinement pattern of KNiPO_4 powder sample (b) VESTA image of KNiPO_4 (c) FTIR spectrum of KNiPO_4 (d) N_2 adsorption/desorption isotherm of KNiPO_4 sample 114
- Figure 4.2** XPS of KNiPO_4 of powder sample; (a) full survey, (b) Ni(2p), (c) K (1s), (d) O (1s) and (e) P (2p) 115

Figure 4.3	(a) Particle distribution of KNiPO ₄ in SEM image, (b) elemental analysis of KNiPO ₄ by EDX, and (c-f) showing the elemental mapping of K, Ni, P, O respectively	116
Figure 4.4	visible lattice fringes containing 120 planes in HRTEM image, (i-ii): FFT and inverse FFT images of the selected region of the (120) plane. (b) shows d spacing of fringes that matches with the (120) plane of the KNiPO ₄ lattice	117
Figure 4.5	(a) cyclic voltammetry of KNiPO ₄ electrode in 2 M KOH electrolyte, (b) peak current density vs square root of the scan rates plot, (c) plot of log (peak current) vs log (scan rate) presenting b Values, (d) capacitive and diffusion control process contribution in the current density at the scan rate of 10 mV/s, (e) capacitive and diffusion control process contribution with different scan rates and (f) presenting surface capacitance and diffusion-controlled interaction process contribution at a scan rate 10 mV/s on the charging peak potential equal to 0.49V.	119
Figure 4.6	(a-b) Trasatti plot at a scan rate of 100 to 1 mV/s during the charge/discharge reactions	122
Figure 4.7	(a) Charge/discharge plot (V vs time) of the KNiPO ₄ electrode at various constant current rates (1, 2, 3, 5, and 10 A/g), (b) capacity/capacitance performance of the KNiPO ₄ in 2 M KOH electrolyte at different current densities, (c) Capacity retention and Coulombic efficiency plot and (d) impedance spectra at 10 mV applied voltage in the frequency range of 1 MHz to 0.1 Hz.	123
Figure 4.8	Full cell performance in two-electrode Hybrid Supercapacitor (HSc) mode containing KNiPO ₄ electrode and activated carbon as a positive and negative electrode; (a) CV plot of individual electrodes at the scan rate of 10 mV/s with Hg/HgO as reference electrode, (b) CV of the full cell at different scan rates, (c) charge/discharge profile of full cell at different constant current rates, (d) Impedance spectra of the full cell at 10 mV applied voltage, (e) capacity retention and Coulombic efficiency plot of the full cell at constant current rates of 10 A/g, and (f) Ragone plot	125

of the full cell in HSc mode.

Figure 5.1	Schematic Illustration of the sequential approach used for predicting supercapacitor capacitance by using machine learning models	138
Figure 5.2	The features used in the dataset	139
Figure 5.3	Original class distribution and class distribution after SMOTE	148
Figure 5.4	Heatmap of the correlation matrix illustrating the relationships among features	149
Figure 5.5	ROC curve for grade A, B, C and D	151
Figure 5.6	Comparative analysis of different machine learning algorithms	152
Figure 5.7	Predicted value versus actual values of specific capacitance	154

TABLES

Table No.	Description	Page No.
Table 1.1	Energy storage performance of some currently used electrode materials	33
Table 2.1	Powder diffraction pattern as a function of various crystal structure, specimen, and instrumental parameters	61
Table 3.1	A comparative study of metal-oxalate-based electrode materials	106
Table 4.1	A comparative study of electrochemical performances of transition metal phosphate containing polyanionic framework structure-based electrode materials	129
Table 5.1	Precision, Recall, F1 Score, and Accuracy of Various Algorithms	150
Table 5.2	Statistical parameters of ML Algorithms	155

LIST OF ABBREVIATIONS

XRD	X-ray Diffraction
HR	SEM-High-Resolution Scanning Electron Microscope
HR	TEM-High-Resolution Transmission Electron Microscope
TGA	Thermogravimetric analysis
FTIR	Fourier transform Infrared Spectroscopy
XPS	X-ray Photoelectron Spectroscopy
BET	(Brunauer, Emmett, and Teller) specific surface
LSV	Linear Sweep Voltammetry
CV	Cyclic Voltammetry
ASCs	Asymmetric Supercapacitors
C _{sp}	specific capacitance
E _{RHE}	Potential respect to the Reversible Hydrogen Electrode
E _{fb}	Flat Band Potential
OER	Oxygen Evolution Reaction
ORR	Oxygen Reduction Reaction
HSC	Hybrid SuperCapacitor
η	overpotential
A	Tafel slope
j	current density, mA/cm ²
j_0	Exchange current density", mA/cm ²
κ	Cohen's kappa or kappa statistic
QDs	Quantum Dots
ML	Machine Learning
SMOTE	Synthetic Minority Over-sampling Technique
Eq	Equation