## **Contents**

About the editors	v
-------------------	---

Preface ---- VII

Bhawana Jain, Reena Rawat, Daniel Amoako Darko

Chapter 1

Carbon allotropes: properties and applications – state of the art — 1

Alimorad Rashidi, Maryam Sirati Gohari, Seyed Ali Rezaei

Chapter 2

Carbon allotropes: synthesis and characterization —— 33

Sourav Kr. Saha, Namhyun Kang

Chapter 3

Corrosion: basics, economic adverse effects, and its mitigation — 67

Maryam Sirati Gohari, Seyed Ali Rezaei, Alimorad Rashidi

Chapter 4

Carbon allotropes for anticorrosive applications, challenges, and opportunities —— 89

Gokul Ram Nishad, Ashwani Kumar Sharma, Dakeshwar Kumar Verma

Chapter 5

Carbon allotropes: mechanism of corrosion prevention and control —— 117

Omar Dagdag, Rajesh Haldhar, Seong-Cheol Kim, Elyor Berdimurodov, Chandrabhan Verma, Ekemini D. Akpan, Eno E. Ebenso

Chapter 6

Graphene and graphene oxide as nanostructured corrosion inhibitors — 133

Sanjukta Zamindar, Manilal Murmu, Naresh Chandra Murmu, Priyabrata Banerjee

Chapter 7

Chemically modified graphene and graphene oxides as corrosion inhibitors —— 149



Manilal Murmu, Sanjukta Zamindar, Naresh Chandra Murmu, Priyabrata Banerjee

**Chapter 8** 

Polymer composites of graphene and graphene oxides as corrosion inhibitors —— 175

Seyed Ali Rezaei, Maryam Sirati Gohari, Alimorad Rashidi
Chapter 9
Carbon nanotubes (CNTs) and their composites as nanostructured
corrosion inhibitors —— 201

Avni Berisha

Chapter 10

Chemically modified CNTs as corrosion inhibitors — 227

Roli Jain, Daniel Amoako Darko, Bhawana Jain, Ruchi Sharma, Reena Rawat **Chapter 11** 

Carbon quantum dots (CQDS), carbon nanorods (CNRS), and their composites as nanostructured corrosion inhibitors —— 241

Seyyed Arash Haddadi, Saeed Ghaderi,

Mohammad Ebrahim Haji Naghi Tehrani, Bahram Ramezanzadeh

Chapter 12

Recent advances in carbon allotropes nanostructured as anticorrosive coatings —— 271

Taiwo W. Quadri, Lukman O. Olasunkanmi, Omolola E. Fayemi, Eno E. Ebenso Chapter 13

Industrial corrosion inhibitors: nanostructured carbon allotropes as ideal substitutes —— 327

Navid Hosseinabadi

Chapter 14

Carbon allotropes-based materials as ideal substitutes for industrially useful self-healing coatings: recent advancements and future proponents —— 355

Abhinay Thakur, Praveen Kumar Sharma, Ashish Kumar
Chapter 15
Economics and commercialization of carbon allotropes nanostructured
corrosion inhibitors — 383

Authorlist ---- 405

Index ---- 409