

Contents

List of authors — VII

Nurşah Kütük, Aslıhan Gürbüz, Gamze Tüzün, Burak Tüzün

Chapter 1

Nanoengineering and nanoscience: current and emerging trends — 1

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

Chapter 2

Polymer nanocomposites: synthesis, modification, properties and applications — 17

Elyor Berdimurodov, Khasan Berdimuradov, Ilyos Eliboev, Lazizbek Azimov,
Yusufboy Rajabov, Jaykhun Mamatov, Bakhtiyor Borikhonov, Abduvali Kholikov,
Khamdam Akbarov

Chapter 3

Covalent and noncovalent surface functionalization of nanomaterials (for enhanced solubility, dispersibility and corrosion prevention potential) — 37

Aysun Aksu, Hüseyin Fatih Çetinkaya, Serap Çetinkaya,
Gamze Tüzün, Burak Tüzün

Chapter 4

MXenes and their composites as corrosion prevention — 53

Bo-kai Liao, Zhi-Gang Luo, Shan Wan, Hao-Wei Deng, Shu-Yi Jiang, Shuang-Jian Li,
Jun-Jie Yang

Chapter 5

Quantum dots in corrosion prevention — 67

Humira Assad, Ashish Kumar

Chapter 6

Carbon nanotubes (SWCNTs/MWCNTs) and functionalized carbon nanotubes in corrosion prevention — 85

Dheeraj Singh Chauhan

Chapter 7

Graphene (Gr)/graphene oxide (GO) and functionalized Gr/GO in corrosion prevention — 99

Dakeshwar kumar Verma, Reema Sahu, Santosh Bahadur Singh, Bharti Yada,
Vikas Kumar Jain, Shailendra Yadav, Vikash Kande, Sharad Tiwari,
Gokul Ram Nishad, Younus Raza Beg, Vandana Mishra, Durgesh Sinha

Chapter 8

Carbon dots (CDs) and heteroatom-doped CDs in corrosion prevention — 121

Muhammed Safa Çelik, Hüseyin Fatih Çetinkaya, Serap Çetinkaya, Gamze Tüzün,
Burak Tüzün

Chapter 9

Polymeric nanoparticles and their composites in corrosion inhibition — 135

Amir Hossein Jafari Mofidabadi, Nariman Alipanah, Ali Dehghani

Chapter 10

Organic–inorganic hybrid nanostructured materials in corrosion prevention — 147

Manash Protim Mudoi, Rhythm Katyal, Khushi Bhatt, Vidushi Singh,
Asmita Choudhary, Sanskriti Gupta

Chapter 11

Ceramic nanomaterials in corrosion prevention — 165

Khasan Berdimuradov, Elyor Berdimurodov, Ilyos Eliboev, Nurbek Umirov,
Bakhtiyor Borikhonov, Abduvali Kholikov, Khamdam Akbarov

Chapter 12

Smart–hybrid nanomaterials in corrosion prevention — 181

Index — 195