



**Figure 1.43** Schematic view of the controlled encapsulation of different nanoparticles in ZIF-8 by adding one type of NPs or two types of NPs (a); TEM images of the different NPs@ZIF-8 formed (b); N<sub>2</sub> isotherms of the Pt NPs@ZIF-8 composite where they observed no differences among them (c); catalytic performances of the Pt@ZIF-8 composites in the hydrogenation studies (d). Source: Reproduced with permission from Lu et al. [194], © 2012/Springer Nature.

## List of Abbreviations

AAS	Atomic Absorption Spectroscopy
AFM	Atomic Force Microscopy
AIM	Atomic Layer Deposition in Metal–Organic Frameworks
ALD	Atomic Layer Deposition
AMS	Accelerator Mass Spectrometry
BET	Brunauer Emmer Teller
BTC	1,3,5-benzenetricarboxylic acid
DCB	1,2-dicyanobenzene
DFT	Density Functional Theory
EDX	Energy-Dispersive X-ray Spectroscopy
EXAFS	Extended X-Ray Absorption Fine Structure
FLIM	Fluorescence Lifetime Imaging Microscope
FTIR	Fourier-Transformed Infrared Spectroscopy
GC/MS	Gas Adsorption/ Mass Spectroscopy
HKUST	Hong Kong University of Science and Technology
HOMO	Highest Occupied Molecular Orbital
HRTEM	High Resolution Transmission Electron Microscopy
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
IR	Infrared Spectroscopy
LAC	Ligand Accelerated Catalysis
MALDI-TOF	Matrix-Assisted Laser Desorption/Ionization source with a Time-of-Flight
MCD	Missing Cluster Defects
MIL	Material of the Institute Lavoisier
MLD	Missing Linker Defects
MM-MOF	Mixed-Metal Metal–Organic Framework
MOCVD	Metal–Organic Chemical Vapor Deposition
MOCP	Metal–Organic Coordination Polymer
MOF	Metal–Organic Framework
MOM	Metal–Organic Material
NMR	Nuclear Magnetic Resonance
NPs	Nanoparticles
OMS	Open Metal Site
PDF	Pair Distribution Function
PIZA	Porphyritic Illinois Zeolite Analogue
POMS	Polyoxometalates
PSM	Post-synthetic Modification
PTIR	Photo Thermal Induced Resonance
PVP	Polyvinylpyrrolidone
PXRD	Powder X-ray Diffraction
SALE	Solvent Assisted Linker Exchange
SBU	Secondary Building Unit
SCXRD	Single-Crystal X-Ray Diffraction

SEM	Scanning Electron Microscopy
SIM	Solvothermal Deposition in Metal–Organic Frameworks
SOMC	Surface Organo-Metallic Chemistry
SSMS	Spark Source Mass Spectrometry
SS-NMR	Solid-State Nuclear Magnetic Resonance
TCPP	Tetrakis(4-carboxyphenyl) porphyrin
TEM	Transmission Electron Microscopy
TGA	Thermogravimetric Analysis
TIMS	Thermal Ionization-Mass Spectrometry
UNLFP	University of Nebraska-Lincoln Porous Framework
UV–Vis	Ultraviolet–Visible
XANES	X-Ray Absorption Near Edge Structure
XAS	X-Ray Absorption Spectroscopy
XPS	X-Ray Photoelectron Spectroscopy

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