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Nota di contenuto	Modern Heterogeneous Oxidation Catalysis: Design, Reactions and Characterization; Contents; Preface; List of Contributors; 1 Concepts in Selective Oxidation of Small Alkane Molecules; 1.1 Introduction; 1.2 The Research Field; 1.3 Substrate Activation; 1.4 Active Oxygen Species; 1.5 Catalyst Material Science; 1.6 Conclusion; References; 2 Active Ensemble Structures for Selective Oxidation Catalyses at Surfaces; 2.1 Introduction; 2.2 Chiral Self-Dimerization of Vanadium Schiff-Base Complexes on SiO <sub>2</sub> and Their Catalytic Performances for Asymmetric Oxidative Coupling of 2-Naphthol 2.2.1 Asymmetric Heterogeneous Catalysis Using Supported Metal Complexes2.2.2 Chiral V-Dimer Structure on a SiO <sub>2</sub> Surface; 2.2.3 Asymmetric Catalysis for Oxidative Coupling of 2-Naphthol to BINOL; 2.3 Low-Temperature Preferential Oxidation of CO in Excess H <sub>2</sub> on Cu-Clusters Dispersed on CeO <sub>2</sub> ; 2.3.1 Preferential Oxidation (PROX) of CO in Excess H <sub>2</sub> on Novel Metal Catalysts; 2.3.2 Characterization and Performance of a Novel Cu Cluster/CeO <sub>2</sub> Catalyst; 2.4 Direct Phenol Synthesis from Benzene and Molecular Oxygen on a Novel N-Interstitial Re <sub>10</sub> -Cluster/HZSM-5 Catalyst

2.4.1 Phenol Production from Benzene with N<sub>2</sub>O, H<sub>2</sub> + O<sub>2</sub>, and O<sub>2</sub>.  
 4.1.1 Benzene to Phenol with N<sub>2</sub>O; 2.4.1.2 Benzene to Phenol with H<sub>2</sub> + O<sub>2</sub>; 2.4.1.3 Benzene to Phenol with O<sub>2</sub>; 2.4.2 Novel Re/HZSM-5 Catalyst for Direct Benzene-to-Phenol Synthesis with O<sub>2</sub>; 2.4.3 Active Re Clusters Entrapped in ZSM-5 Pores; 2.4.4 Structural Dynamics of the Active Re<sub>10</sub> Cluster; 2.5 Conclusion; References; 3 Unique Catalytic Performance of Supported Gold Nanoparticles in Oxidation; 3.1 Introduction; 3.2 Low-Temperature CO Oxidation; 3.2.1 Low-Temperature CO Oxidation in Air  
 3.2.1.1 Junction Perimeter Between Au Particles and the Support  
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 3.5.5 Oxidation of Alkanes and Alkenes

## Sommario/riassunto

Filling a gap in the current literature, this comprehensive reference presents all important catalyst classes, including metal oxides, polyoxometalates, and zeolites. Readers will find here everything they need to know -- from structure design to characterization, and from immobilization to industrial processes. A true must-have for anyone working in this key technology.