LIST OF SCHEMES

Scheme 1.1: Comparison between energy conversion in conventional technology and fuel cells 18

Scheme 1.2: Methanol oxidation over a platinum catalyst 24

Scheme 1.3: A six-step methanol oxidation mechanism on conventional Pt catalysts 25

Scheme 1.4: The different pathways (and a number of identified intermediates) in the oxidation of methanol 37

Scheme 3.1: Mechanism of benzyl alcohol oxidation via lattice oxygen vacancy in OMS-2 catalysts 85

Scheme 5.1: Formation of adsorbed CO as a result of incomplete oxidation of methanol over OMS-2 (S) catalyst 105

Scheme 5.2: Methanol oxidation over OMS-2 catalyst by lattice oxygen participation followed by its regeneration 105

Scheme 5.3: Methanol oxidation over S/Ru-C catalyst 107