325c Characterization of Highly Dispersed Supported Metals: Spectroscopic Methods to Investigate the Metal, Ligands, and Metal-Support Interface

Bruce C. Gates

Transition metal complexes and clusters on oxide and zeolite supports are important technological catalysts. Characterization of such samples is challenging because of the smallness and nonuniformity of the supported species. To maximize the structural information that can be obtained from the characterizations, we have investigated structurally simple and uniform supported metals, including complexes of Re, Rh, and Au and clusters including Ir4, Ir6, Re3, Os3, and Rh6 on metal oxides and zeolites. We report data representing the metals, the ligands on them, and the metal–support interface. The characterization techniques include IR, EXAFS, XANES, 1H NMR, and 13C NMR, combined with density functional theory and high-resolution TEM. Data include spectroscopic characterizations of these catalysts in the working state.