The Chemist's Interactions

Seminars @the Chemistry Department

Friday, 24TH January 2020

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Università degli Studi di Milano - Bicocca

Room G13
H 14.30

Unveiling the nature of single-atom catalysts

In the past, single-atom catalysts could not be clearly visualized and characterized due to limitations associated with instrument resolution. Today this is a new frontier in heterogeneous catalysis due to the high activity and selectivity for various catalytic reactions. In this talk we discuss the nature of isolated Rh, Ru and Pt species deposited on two representative oxide surfaces, anatase TiO_2 (a reducible oxide), and tetragonal ZrO_2 (a non-reducible oxide). These systems have been characterized experimentally using high-resolution scanning transmission electron microscopy (STEM), Fourier transform infrared spectroscopy (FTIR), and temperature programmed desorption (TPD) spectra of adsorbed CO probe molecules. Combining these data with extensive Density Functional Theory (DFT) calculations we provide an unambiguous identification of the stable single-atom species present on these supports and of their dynamic behavior.

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