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Investigation of Gas Phase Gold Oxide Cations Towards the Oxidation of CO NELLY MOORE, GRANT JOHNSON, A. WELFORD CASTLEMAN, JR., Pennsylvannia State University — Studies are underway in our laboratory aimed at providing information to aid in the design of more efficient and selective catalysts. Gas phase metal oxide cluster studies are becoming a valuable complementary technique to surface methods for elucidating the mechanistic details and active sites of catalytic systems. It is our present goal to uncover possible species responsible for the increased activity and selectivity of gold oxide catalysts utilizing gas phase studies. To gain insight into the bonding properties and structures of gold oxide clusters, collision induced dissociation experiments were undertaken. In addition, reactivity studies of gold oxide clusters with CO provided information into different reaction pathways based on size, stoichiometry, and charge state. Reactions of gold oxide cations with CO were explored and compared to anionic cluster reactions previously conducted in our laboratory. These studies have provided evidence of various reaction mechanisms including oxidation, replacement, and association which will be presented.

Nelly Moore
Pennsylvania State University

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