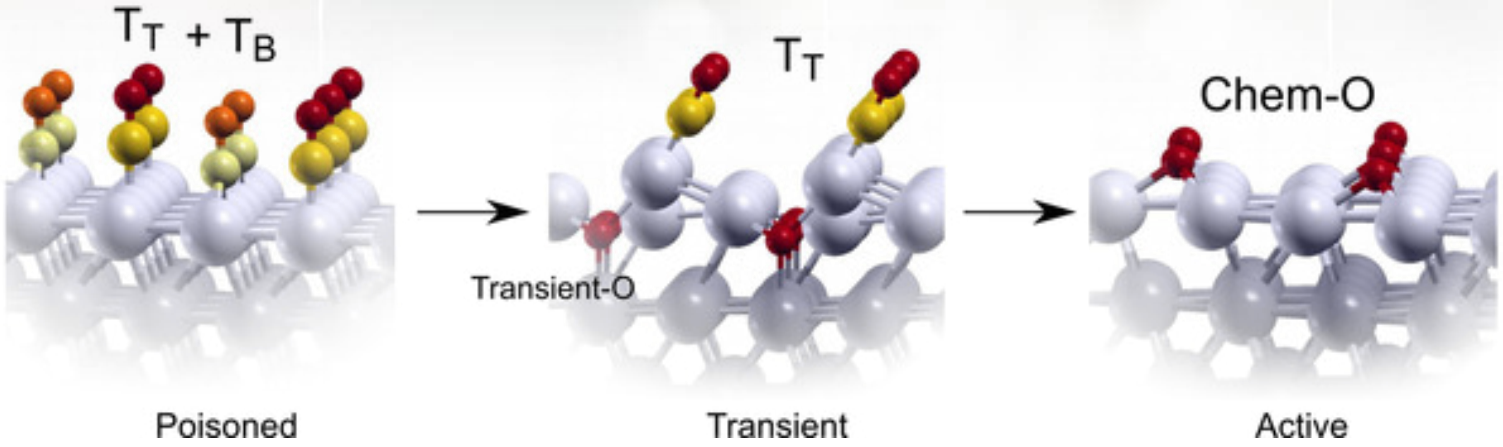
Simultaneous Ignition of CO Catalytic Oxidation



The three different stages of simultaneous ignition of catalytic CO oxidation: (from left to right) before the ignition, transient phase during ignition and active catalytic phase.

Scientific Achievement

Scientists discovered that the key to simultaneous ignition of the catalytic oxidation of carbon monoxide (CO) at different platinum (Pt) surfaces is oxygen build up below the surface.

Significance and Impact

Catalytic oxidation of CO is highly relevant for many applications such as car exhaust cleaning; this work offers new insights into the reaction mechanism.

Research Details

- Investigated a curved Pt surface with multiple research methods including studies at the IOS beamline at NSLS-II.
- Found the ignition happens simultaneously at all crystal planes through a transient phase.
- Varying the reaction conditions changed the ignition temperature, but not the simultaneous ignition.

F. Garcia-Martinez, C. García-Fernández, J. P. Simonovis, A. Hunt, A. Walter, I. Waluyo, F. Bertram, L. R. Merte, M. Shipilin, S. Pfaff, S. Blomberg, J. Zetterberg, J. Gustafson, E. Lundgren, D. Sánchez-Portal, F. Schiller, J. Enrique *Angew. Chem. Int. Ed.* **59** (45), 20037-20043 (2020).

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