Design and Characterization of Low-Cost and Non-PGM Catalysts for the Treatment of Tailpipe Emissions

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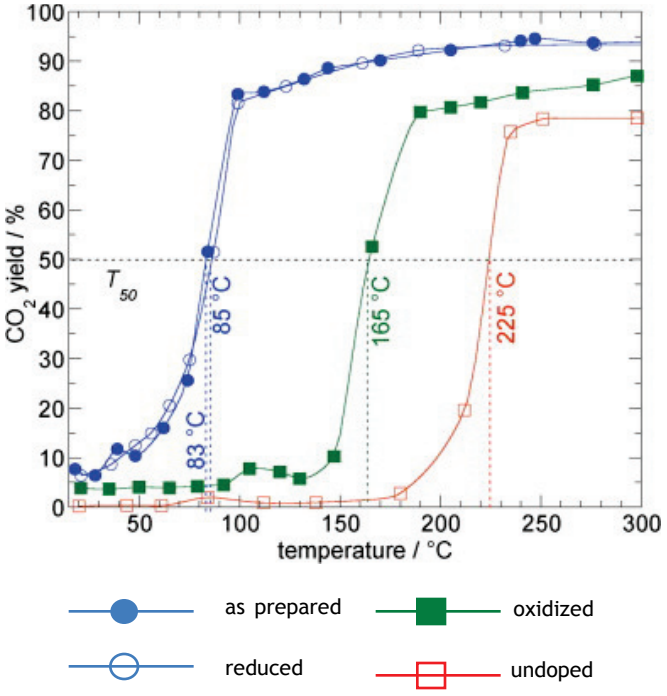
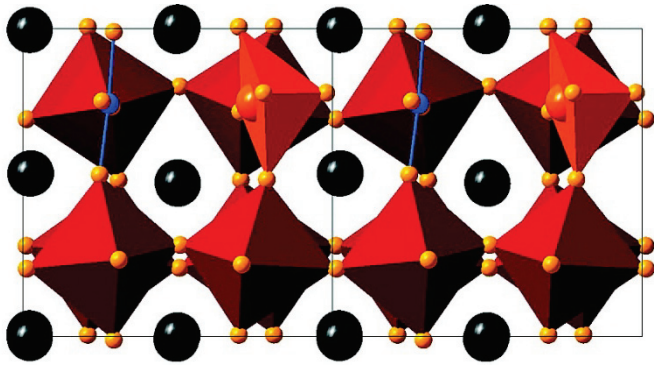
Catalytic treatment of vehicle exhaust is performed primarily by platinum, palladium and rhodium (PGMs) supported on thermally stable high surface area mixed metal oxides. Our work focuses on the development of novel emission control catalysts that stabilize these rare and expensive metals (and eventually replace them with abundant, low-cost base metals) in novel oxide matrices, particularly complex oxides such as perovskites.





These light-off curves (left) show low temperature CO oxidation by palladium(II) doped into a $BaCeO_3$ perovskite lattice (structure shown above), showing that it is possible to envisage the use of such materials as catalysts for energy-efficient diesel and lean-burn engines.

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Li, J.; Singh, U.G.; Schladt, T.D.; Stalick, J.K.; Scott, S.L.; Seshadri, R.; *Chem. Mater.* **2008**, 20, 6567.

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