

University of New Mexico
UNM Digital Repository

Shared Knowledge Conference

2018 Conference

Nov 7th, 3:00 PM - 4:00 PM

Achieving high catalytic activity and redox stability of doped ceria through a novel sol gel synthesis

Christopher Riley

University of New Mexico, crriley@unm.edu

Follow this and additional works at: <https://digitalrepository.unm.edu/skc>

 Part of the [Nanoscience and Nanotechnology Commons](#), and the [Other Materials Science and Engineering Commons](#)

Riley, Christopher. "Achieving high catalytic activity and redox stability of doped ceria through a novel sol gel synthesis." (2018).
<https://digitalrepository.unm.edu/skc/2018/posters/59>

This Event is brought to you for free and open access by UNM Digital Repository. It has been accepted for inclusion in Shared Knowledge Conference by an authorized administrator of UNM Digital Repository. For more information, please contact disc@unm.edu.

Shared knowledge conference 2018

Chris Riley

Ceria is widely studied in catalysis because of its high oxygen mobility and storage capacity. These properties are enhanced by the incorporation of dopant atoms into the ceria crystal structure. However, creating a homogeneously doped structure requires a suitable synthesis technique. Otherwise, dopant atoms form an oxide phase on the ceria surface, which blocks highly active catalytic sites. Traditional production methods allow for cerium and dopant ions to segregate during synthesis. In this work, we demonstrate a novel sol gel synthesis method for producing homogeneously doped ceria. The method is easy and avoids the use of hazardous chemicals. Higher dopant loadings and surface areas are achieved, which improves catalytic activity. Further, doped ceria is shown to be stable in both oxidizing and reducing environments, under which traditional catalysts deactivate.