Contribution ID: **45** Type: **not specified**

Sustain-able Nanocatalysts for Fuel Cells and Splitting Water: MetalFree, HeteroatomDoped Carbons and Noble Metal Free Oxides

Tuesday, 10 March 2015 11:00 (30 minutes)

The lack of sustainable and efficient catalysts for many renewable energy applications (e.g., fuel cells and water splitting) and the unabated negative environmental impacts of fossil fuels remain among the most pressing issues facing the world today. In this talk I will discuss my research group's recent effort s on the synthesis of heteroatomdoped metalfree or noble metalfree nanoporous and mesoporous carbon, metal oxide and carbon/metal oxide hybrid materials that exhibit high catalytic and electrocatalytic activity for reactions such as oxygen reduction reaction hydrogen evolution reaction, and hydrazine oxidation—reactions that are relevant to fuel cells, water splitting, renewable energy, and so on. The catalytic activity of some of these materials is comparable or better than platinumbased catalyst s, conventional catalysts that are widely used for such reactions but are deemed unsustainable due to their scarcity and high cost. Our findings, which defy the conventional paradigms, are also import ant for fundamental studies in the current stateof theart of catalysis that rely only on met allic syst ems. In the last part of my talk, I will describe novel design and "nanost ruct uring" approaches for a series of core-shell nanostructured materials with efficient catalytic or electrocatalytic activities for water splitting, hydrogen evolution and oxygen reduction reactions.

Primary author: ASEFA, Tewodros (Rutgers University at New Brunswick)

Presenter: ASEFA, Tewodros (Rutgers University at New Brunswick)

Session Classification: 3A Safer by design products, production and processes

Track Classification: Parallel session 3A: Safer by design products, production and processes