

Microwave-assisted solution combustion synthesis and characterization of Ceria-based oxides for CO oxidation

The main objective of the present project is to prepare ceria and its oxides by Microwave - assisted solution combustion synthesis and study the CO oxidation activity. Physiochemical characterization and evaluation of the prepared oxides is performed by various spectroscopic techniques and non-spectroscopic techniques. Investigations to be carried out to obtain the correlation between the pure ceria and its oxides are as follows:

Investigating the control of dopants over the redox properties of ceria and stability of defects present in the solid solutions. Evaluating the OSC properties of the solid solutions synthesized and the Catalytic activity studies by performing CO oxidation reaction. Present investigations also involve the study of changes in physiochemical properties of mixed oxides of ceria and doped ceria on correlation with pure ceria. Changes in physiochemical properties are as follows: improved redox properties there by enhanced BET surface area, thermal stability, OSC, sustained towards sintering, and better CO oxidation.

In the present project, the CeO_2 and its oxides are prepared by MWCS and the as-synthesized CeO_2 and modified ceria catalysts are subjected to evaluation by XRD, UV-Vis, BET Method, H_2 -TPR, XPS to study the modified physiochemical properties, and CO oxidation activity.