

Brief review of ceria and modified ceria: synthesis and application

Nor Aqilah Mohd Fadzil^a, Mohd Hasbi AB Rahim^a and Gaanty Pragas Maniam^b

^a Faculty of Industrial Sciences & Technology, Universiti Malaysia Pahang Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Pahang, Malaysia

^b Central Laboratory, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Pahang, Malaysia

ABSTRACT

This brief review paper discusses synthesis techniques for cerium (IV) oxide (ceria) that leads to relative differences in shape, size and dimension. The alterations in synthesis parameters have also been highlighted since it affects the desired application performance. For instance, the same synthesis technique of precipitation will result different morphology of ceria, once heat treatment is introduced. Furthermore, the synthesis technique complimentary with aging time generally will contribute to the better properties of the final product such as different ceria structure and thus resulting high surface area. Mostly the structure of ceria is precipitant dependent oriented. Therefore, the various selection of precipitant; sodium hydroxide, ammonia solution or oxalic acid will yield different structure, morphology and properties of ceria. Additionally, this paper reported on the recent applications in the catalysis, electrochemistry, and biomedical fields to justify the relevance and significant development of ceria.

KEYWORDS:

Brief; Ceria; Cerium (IV) oxide; Synthesis techniques