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(71) Applicant (for all designated States except US):
EXXONMOBIL CHEMICAL PATENTS INC.
[US/US]; A Corporation of the State Of Delaware, 5200
Bayway Drive, Baytown, TX 77520 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **CHUN, ChangMin**
[KR/US]; 106 Tomahawk Court, Belle Mead, NJ 08502
(US). **HERSHKOWITZ, Frank** [US/US]; 509 Lyons
Road, Liberty Corner, NJ 07938 (US).

(74) Agents: **ARECHDERRA, Leandro** et al.; Exxonmobil
Chemical Company, P.O. Box 2149, Baytown, TX
77522-2149 (US).

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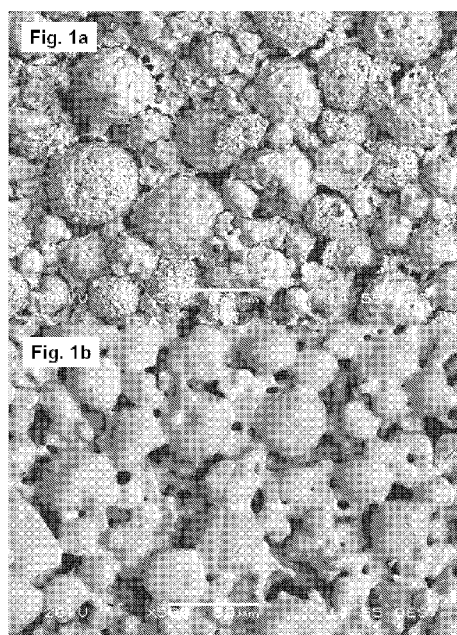
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(54) Title: HEAT STABLE FORMED CERAMIC, APPARATUS AND METHOD OF USING THE SAME

FIGURE 1



(57) Abstract: In one aspect, the invention includes a heat stable, formed ceramic component that includes a multimodal grain distribution including (i) at least 50 wt% of coarse grains including stabilized zirconia, the coarse grains comprising a D50 grain size in the range of from 5 to 800 μm , based upon the total weight of the component; and (ii) at least 1 wt% of fine grains comprising a D50 average grain size not greater than one-fourth the D50 grain size of the coarse grain, dispersed within the coarse grains, based upon the total weight of the component; wherein after sintering, the component has porosity at ambient temperature in the range of from 5 to 45 vol.%, based on the formed volume of the component. In other embodiments, the invention includes a process for the manufacture of a hydrocarbon pyrolysis product from a hydrocarbon feed using a regenerative pyrolysis reactor system, comprising the steps of: (a) heating a pyrolysis reactor comprising a bi-modal stabilized zirconia ceramic component to a temperature of at least 15000C to create a heated reactive region, wherein after exposing the component to a temperature of at least 15000C for two hours the component has a bulk porosity measured at ambient temperature in the range of from 5 to 45 vol.%, based on the bulk volume of the component; (b) feeding a hydrocarbon feed to the heated pyrolysis reactor to pyrolyze the hydrocarbon feed and create a pyrolyzed hydrocarbon feed; and (c) quenching the pyrolyzed hydrocarbon feed to produce the hydrocarbon pyrolysis product.

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