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(54) Title: SOLID ACID CATALYZED PARAFFIN ALKYLATION WITH RARE EARTH-MODIFIED MOLECULAR SIEVE ADSORBENTS

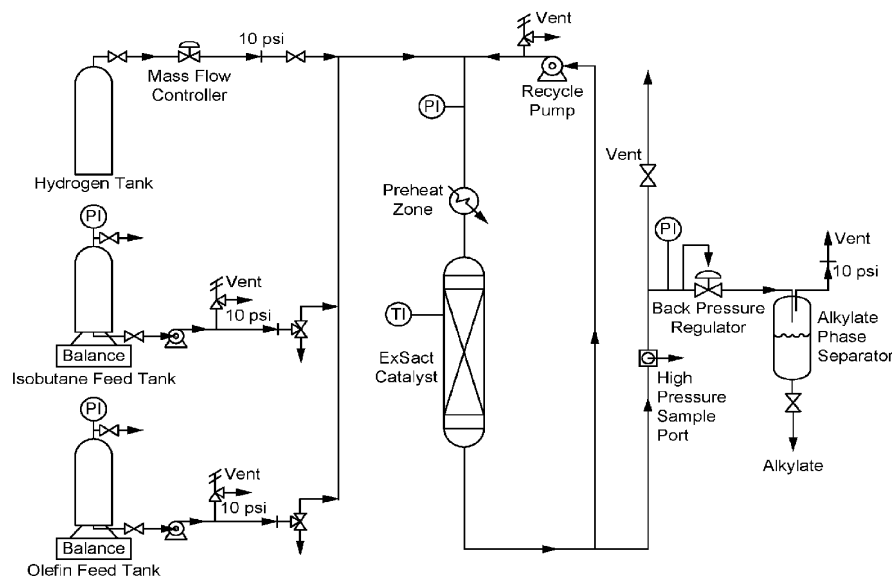


FIG. 1

(57) Abstract: This invention describes methods of alkylating isobutane which include a catalytic reaction system comprising a crystalline zeolite catalyst and a rare earth-modified molecular sieve adsorbent (RE-MSA). The crystalline zeolite catalyst comprises sodalite cages and supercages, a Si/Al molar ratio of 20 or less, less than 0.5 weight percent alkali metals; and up to 5 wt% of Pt, Pd and or Ni, and acid-site density (including both Lewis and Brnsted acid sites) of at least 100 mole/gm. The RE-modified molecular sieve adsorbent (Re-MSA) comprising sodalite cages and supercages, a Si/Al molar ratio of 20 or less, less than 1 wt% of alkali metals, RE (rare earth elements) in the range of 10 to 30 wt% and transition metals selected from groups 9-11 in the range from 2 wt% to 10 wt; and acid-site density of no more than 30 mole/gm. The invention also includes methods of making RE-MSA.

[Continued on next page]

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