METHODS OF PRODUCING ALKYLATED HYDROCARBONS FROM A LIQUID PRODUCED FROM AN IN SITU HEAT TREATMENT

The invention provides methods for producing alkylated hydrocarbons that includes producing formation fluid from a subsurface in situ heat treatment process; separating the formation fluid to produce a liquid stream and a first gas stream, fractionating the liquid stream to produce at least a second gas stream and introducing the first gas stream and the second gas stream into an alklyation unit to produce alkylated hydrocarbons. The first gas stream may include olefins and the olefins in the first gas stream may enhance alkylation. The second gas stream may include hydrocarbons having a carbon number of at least 3.

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For two-letter codes and other abbreviations, refer to the “Guidance Notes on Codes and Abbreviations” appearing at the beginning of each regular issue of the PCT Gazette.

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

ClOGr E21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No</th>
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<td>Y</td>
<td>paragraphs [1854], [2133], [2162], [2438]; figures 124,184,364</td>
<td>1-10, 18-20</td>
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<td>Y</td>
<td>US 2 381 256 A1 (RICHARD CALLAWAY JOHNN) 7 August 1945 (1945-08-07) claim 1; figure 1; example 1</td>
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<td>Y</td>
<td>US 3 992 474 A1 (SOBEL JAY E) 16 November 1976 (1976-11-16) claims 1,6; figure 1</td>
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Further documents are listed in the continuation of Box C

See patent family annex

Date of the actual completion of the international search: 23 February 2007

Date of mailing of the international search report: 30/05/2007

Name and mailing address of the ISA/
European Patent Office, P B 5818 Patentlaan 2
NL- 2280 HV Rijswijk
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Authorized officer: Deurinck, Patricia
This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos because they relate to subject matter not required to be searched by this Authority, namely...

2. Claims Nos because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically...

3. Claims Nos because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6(4)(a)...

This International Searching Authority found multiple inventions in this international application, as follows:

**see additional sheet**

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos...

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims, it is covered by claims Nos 1-10, 18-20...

Remark on Protest

- [ ] The additional search fees were accompanied by the applicant's protest
- [ ] No protest accompanied the payment of additional search fees
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-10, 18-20

   a method for producing alkylated hydrocarbons comprising producing formation fluid, separating the formation fluid to produce a liquid stream and a first gas stream, fractionating the liquid stream to produce at least a second gas stream and introducing the first gas stream and the second gas stream into an alkylation unit

2. claims: 11-20

   a method for producing alkylated hydrocarbons comprising producing formation fluid, separating the formation fluid to produce a liquid stream, catalytically cracking the liquid stream, separating at least a portion of the crude product to produce a gasoline hydrocarbon stream, catalytically cracking the gasoline hydrocarbon stream to produce a crude olefin stream and introducing the crude olefin stream into an alkylation zone
### INTERNATIONAL SEARCH REPORT

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<tr>
<td>US 2381256 A1</td>
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