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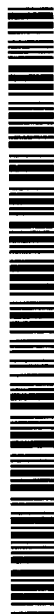


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(54) Title: PREDICTING PROXIMITY TO COKE FORMATION

(57) Abstract: The invention may be used to evaluate suitability of hydrocarbon materials to various types of processing methodologies, or to determine processing parameters, either prior to processing or during processing. Prediction of proximity to formation of inhomogenous products may result in optimizing process parameters, or increasing output of desirable products, or decreasing energy use, or decreasing amounts of emissions of harmful compounds per unit of such hydrocarbon materials compared to conventional processing technology. Homogenous products produced with optimized conditions resulted from the application of the invention, may also have a higher level of purity.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/15950

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : GO1N 35/08, 31/00, 31/16, 33/00 US CL : 436/55, 60, 139, 163 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) U.S. : 436/55, 60, 139, 163 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 practicable, search terms used) STN		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4,628,204 A (MAES) 09 December 1986, col. 1, 2, 4	17-26, 30-36, 45-49, 63-71, 79-89, 92, 93
Y	US 4,493,765 A (LONG ET AL.) 15 January 1985, Abstract, col. 1, lines 18-30,	37, 38, 50-56
Y	US 5,574,215 A (BUNGER ET AL.) 12 November 1996, Abstract, col. 10, lines 43-55	57-62
Y	US 5,092,983 A (EPPIG ET AL.) 03 March 1992, Abstract, col. 3 (A), (B), col. 4 (C)	50-58
Y	US 5,861,228 A (DESCALES ET AL.) January 19, 1999, Abstract, col. 1, lines 60-68, col. 2, lines 1-10	54-56
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family	
Date of the actual completion of the international search 12 MARCH 2001		Date of mailing of the international search report APR 30 2001
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230		Authorized officer YELENA G. GAKH <i>Yelena Gakh</i> Telephone No. (703) 308-0661

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US00/15950

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	PAULI ET AL. Book of Abstracts, 217th ACS National Meeting, Anaheim, CA, March 21-25 (1999), PETR-007. American Chemical Society: Washington, D.C.	57-62

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/15950

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: 1-16
because they relate to subject matter not required to be searched by this Authority, namely:

Rule 67.1. No International Preliminary Examining Authority shall be required to carry out an international preliminary examination on an international application if, and to the extent to which, its subject matter is any of the following: (v) mere presentations of information
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).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

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

Please See Extra 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.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
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BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

Group I, claim(s)17-92, drawn to the method of processing a hydrocarbon material.

Group II, claim 93, drawn to the apparatus for processing the hydrocarbon material.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: method and apparatus of Groups I and II share the same technical feature which is well known in the art, namely any device from the group of NMR spectrometer, NMR tomograph, mass spectrometer, IR spectrometer, Raman spectrometer, gel electrophoretic or size exclusion or paper chromatograph.