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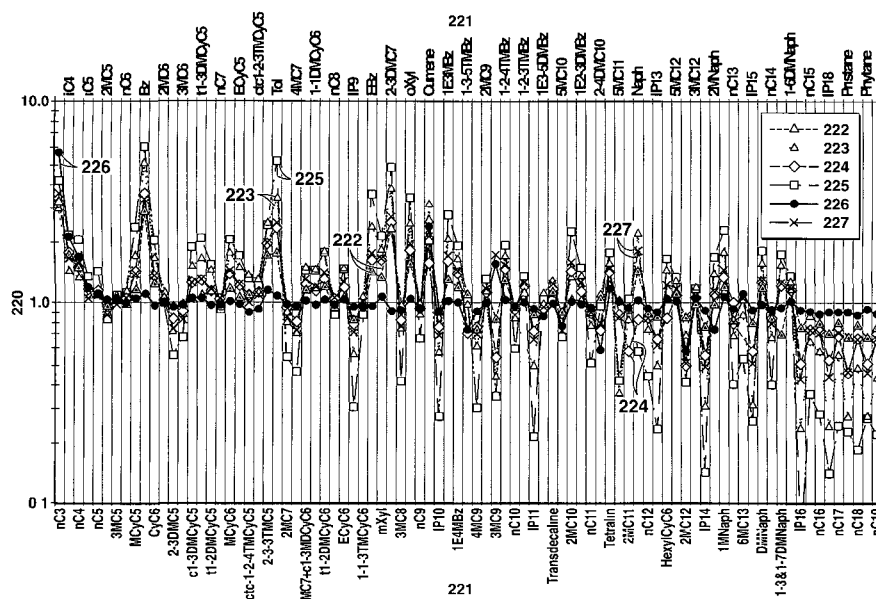
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(54) Title: HEATING AN ORGANIC-RICH ROCK FORMATION IN SITU TO PRODUCE PRODUCTS WITH IMPROVED PROPERTIES



(57) Abstract: A method of producing hydrocarbon fluids with improved hydrocarbon compound properties from a subsurface organic-rich rock formation, such as an oil shale formation, is provided. The method may include the step of heating the organic-rich rock formation in situ. In accordance with the method, the heating of the organic-rich rock formation may pyrolyze at least a portion of the formation hydrocarbons, for example kerogen, to create hydrocarbon fluids. Thereafter, the hydrocarbon fluids may be produced from the formation. Hydrocarbon fluids with improved hydrocarbon compound properties are also provided.

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A. CLASSIFICATION OF SUBJECT MATTER

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USPC - 166/266

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)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Searcher's own books; IPC(8) - E21B 43/OQ (2008.01); USPC:166/266; 166/267, 166/271, 166/272.3, 166/272.7, 166/303, 166/306, 166/308 1; Google Scholar

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Searched US-PTO WEST US Pregrant Published Applications, US Patents, and Google Scholar for MEURER, KAMINSKY, OTTEN, SYMINGTON, YEAKEL, pyrolysis, shale, ratio, ethylbenzene, xylene, benzene

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
Y	US 2,732,195 A (LJUNGSTROM) 24 January 1956 (24.01.1956); Figures 1 and 15; col. 1 at lines 17-25, and col. 7 at lines 37-39.	1-362
Y	TISSOT, B.P. et al. Petroleum Formation and Occurrence: A New Approach to Oil and Gas Exploration. New York: Springer-Verlag, 1978, ISBN 0387086986. Pages 118, 174, 179-180, 350-351 and 410.	1-362
Y	HENDERSON, W. et al. Thermal Alteration as a Contributory Process to the Genesis of Petroleum. Nature, 1968, vol. 219, pages 1012-1016. Table 2 on page 1013; Figure 3 on page 1013; page 1015.	1-362
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Y	US 3,228,869 A (IRISH) 11 January 1966 (11.01.1966); Col. 5 at lines 3-15.	333-334 and 358-359
A	US 2006/0213657 A (Berchenko et al.) 28 September 2006 (28.09.2006); entire document	1-362

☐ Further documents are listed in the continuation of Box C.

<ul style="list-style-type: none"> • 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 application or patent but 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 	<ul style="list-style-type: none"> "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
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