



(43) International Publication Date
28 June 2012 (28.06.2012)

(10) International Publication Number
WO 2012/088068 A3

(51) International Patent Classification:
E21B 43/17 (2006.01)

(21) International Application Number:
PCT/US2011/066086

(22) International Filing Date:
20 December 2011 (20.12.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/426,736 23 December 2010 (23.12.2010) US

(71) Applicant: **RHODIA, INC.** [US/US]; 8 Cedar Brook Drive, Cranbury, NJ 08512 (US).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **DAHANAYAKE, Manilal** [US/US]; 17 Reed Drive North, Princeton Junction, NJ 08550 (US). **CHABERT, Max** [FR/FR]; 17 Rue La Boubee, F-33800 Bordeaux (FR). **MORVAN, Mikel** [FR/FR]; 32 Rue Jacques Ellul, F-33600 Pessac (FR). **SORIN, David** [FR/FR]; 12 Bis Rue Edouard Lefebvre, F-78000 Versailles (FR).

(74) Agent: **RUGGIERO, Charles, N.J.**; Ohlandt, Greeley, Ruggiero & Perle, L.L.P., One Landmark Square, 10th Floor, Stamford, CT 06901-2682 (US).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,

CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:

10 May 2013

(54) Title: METHOD FOR MOBILITY CONTROL IN OIL-BEARING CARBONATE FORMATIONS

(57) Abstract: A method for enhancing recovery of oil from an oil-bearing carbonate formation within a reservoir. The method has the steps of (a) introducing a viscous gel under pressure into the oil-bearing carbonate formation and (b) extracting oil. The aqueous viscous gel has water and an amount of a non-polymeric viscosifying surfactant sufficient to provide the flooding fluid with an oil/water interfacial surface tension of about 10 mN/m or less and a viscosity of about 10 cP or more of the one or more non-polymeric surfactants. The one or more non-polymeric, viscosifying surfactants is selected from the group of one or more cationic surfactants, one or more zwitterionic surfactants, one or more anionic surfactants, one or more amphoteric surfactants, and combinations thereof. In a preferred embodiment, the aqueous viscous gel is also substantially free of solids.



WO 2012/088068 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2011/066086

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - E21B 43/17 (2012.01)

USPC - 507/936

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)

IPC(8) - C09K 8/584, 8/62; E21B 43/17, 43/22, 43/26; E21C 25/10 (2012.01)

USPC - 166/270.1, 270.2, 271, 275, 300, 305.1, 401; 507/936

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)

PatBase, Google Scholar

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/0107897 A1 (DAHANAYAKE et al) 17 May 2007 (17.05.2007) entire document	1, 2, 7-20
Y		3-6
Y	US 2009/0023618 A1 (FUTTERER et al) 22 January 2009 (22.01.2009) entire document	3-6
A	US 4,589,487 A (VENKATESAN et al) 20 May 1986 (20.05.1986) entire document	1-6
A	US 4,231,427 A (KALFOGLOU) 04 November 1980 (04.11.1980) entire document	1-6

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

* 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

"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

01 April 2012

Date of mailing of the international search report

15 MAR 2013

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-3201

Authorized officer:

Blaine R. Copenheaver

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774