

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
22 January 2004 (22.01.2004)

PCT

(10) International Publication Number
WO 2004/007897 A3

(51) International Patent Classification⁷: **C09K 7/02**,
E21B 21/00

(21) International Application Number:
PCT/US2003/021717

(22) International Filing Date: 14 July 2003 (14.07.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/195,686 15 July 2002 (15.07.2002) US

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
5 August 2004

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.

(54) Title: SHALE HYDRATION INHIBITION AGENT AND METHOD OF USE

(57) Abstract: A water-base drilling fluid for use in drilling wells through a formation containing a shale which swells in the presence of water. The drilling fluid preferably includes: an aqueous based continuous phase, a weight material, and a shale hydration inhibition agent having the formula: $H_2N - R - \{OR'\}_X - Y \cdot [H^+ B^-]$ in which R and R' are alkylene groups having 1 to 6 carbon atom and x is a value from about 1 to about 25. The Y group should be an amine or alkoxy group, preferably a primary amine or a methoxy group. The acid $H^+ B^-$ is a protic acid selected from the group consisting of inorganic acids and organic acids, illustrative examples of which include: hydrochloric, hydrobromic, sulfuric, phosphoric, nitric, boric, perchloric, formic, acetic, halogenated acetic, propionic, butyric, maleic, fumaric, glycolic, lactic, citric and combinations of these. The shale hydration inhibition agent should be present in sufficient concentration to reduce the swelling of the shale. Also inclusive of the present invention is a method of reducing the swelling of shale clay encountered during the drilling of a subterranean well, the method comprising circulating in the well a water-base drilling fluid formulated in accordance with the present invention.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/21717

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C09K 7/02; E21B 21/00

US CL : 175/64, 65, 72; 507/133, 140, 145, 905

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. : 175/64, 65, 72; 507/113, 117, 131, 133, 140, 145, 246, 905, 925

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,908,814 A (PATEL ET AL) 01 June 1999 (01.06.1999), see entire document.	1-18
A	US 5,593,952 A (JARRETT) 14 January 1997 (14.01.1997), see entire document.	1-18
A	US 5,211,250 A (KUBEENA, JR. ET AL) 18 May 1993 (18.05.1993), see entire document.	1-18
A	US 4,519,922 A (SUTTON ET AL) 28 May 1985 (28.05.1985), see entire document.	1-18
A	US 3,404,165 A (BUDDE, JR. ET AL) 01 October 1968 (01.10.1968), see entire document.	1-18

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

☐ See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

30 September 2003 (30.09.2003)

Date of mailing of the international search report

29 JUN 2004

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