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(71) Applicant (for all designated States except US): **BAKER HUGHES INCORPORATED** [US/US]; P.O. Box 4740, Houston, TX 77210 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **MONTEIRO, Othon** [US/US]; 4128 Oberlin St., Houston, TX 77005 (US).
QUINTERO, Lirio [US/US]; 128 Gessner, Houston, TX 77024 (US).

(74) Agent: **LITTLEFIELD, Stephen, A.**; Baker Hughes Incorporated, P.O. Box 4740, Houston, TX 77210-4740 (US).

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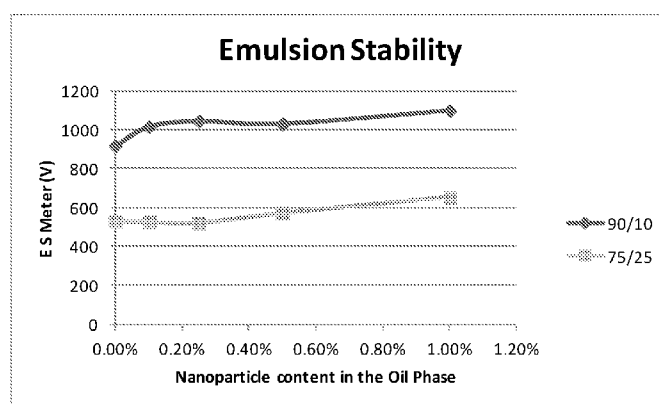
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(54) Title: GRAPHENE-CONTAINING FLUIDS FOR OIL AND GAS EXPLORATION AND PRODUCTION

FIG. 3



(57) Abstract: A base fluid may contain graphene nanoparticles where the base fluid may include an oil-based fluid, a water-based fluid, and combinations thereof. The oil-based fluid may be a brine-in-oil emulsion, or a water-in-oil emulsion, and the water-based fluid may be an oil-in-water emulsion, or an oil-in-brine emulsion; and combinations thereof. The addition of graphene nanoparticles to the base fluid may improve one or more properties of the fluid, which may include the flow assurance properties of the fluid, the fluid loss control properties of the fluid, the rheological properties of the fluid, the stability of the fluid, the lubricity of the fluid, the electrical properties of the fluid, the viscosity of the fluid, the thermal properties of the fluid, and combinations thereof. The fluid may be a drilling fluid, a completion fluid, a production fluid, and/or a servicing fluid.

A. CLASSIFICATION OF SUBJECT MATTER

C09K 8/06(2006.01)i, C09K 8/32(2006.01)i, C09K 8/36(2006.01)i, C09K 8/26(2006.01)i, C09K 8/58(2006.01)i, C09K 8/502(2006.01)i

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)

C09K 8; E21B 43

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: subterranean, wellbore, oil field, graphene, drilling fluid, fluid loss control, flow assurance, rheological properties, emulsion properties, lubricity, electrical properties, thermal properties.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2009-089391 A2 (WILLIAM MARSH RICE UNIVERSITY) 16 July 2009 See abstract; paragraphs [0005], [0029], [0033] and [0035] - [0037]; all examples.	1-17
X	WO 2011-016889 A2 (WILLIAM MARSH RICE UNIVERSITY) 10 February 2011 See abstract; paragraphs [0007], [0053], [0054], [0071] and [0072]; all examples.	1,3-6,8-10,12-17
A	See the whole document.	2,7,11
X	US 2011-0046027 A1 (ZHAMU, ARUNA et al.) 24 February 2011 See abstract; paragraphs [0002], [0042] - [0047] and [0095]; all examples.	1,2,4-6,8-11,13,14 ,16,17
A	See the whole document.	3,7,12,15
PX	WO 2011-159744 A1 (SAUDI ARBIAN OIL COMPANY et al.) 22 December 2011 See abstract; all claims.	1-6,8-14,16,17
PX	KOSYNKIN, D. V. et al. "Graphene Oxide as a High Performance Fluid Loss Control Additivity in Water Based Drilling Fluids", Applied Materials and Interfaces Vol. 4, No. 1, Pages 222 - 227, 02 December 2011 See pages 223 - 226.	1-6,8-14,16,17



Further documents are listed in the continuation of Box C.



See patent family annex.

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"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

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Korean Intellectual Property Office
189 Cheongsu-ro, Seo-gu, Daejeon Metropolitan
City, 302-701, Republic of Korea

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Authorized officer

CHO Han Sol

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International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	WO 2012-009128 A2 (BAKER HUGHES INCORPORATED) 19 January 2012 See abstract; all claims.	1-6,8-14,16,17
E	US 2012-0090845 A1 (HUANG, TIANPING et al.) 19 April 2012 See abstract; paragraphs [0011] - [0023].	1-6,8-14,16,17
E	US 2012-0165231 A1 (MILLER, JEFFREY JAMES et al.) 28 June 2012 See abstract; paragraphs [0022] - [0052]; claim 1.	1-6,8-14,16,17

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

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