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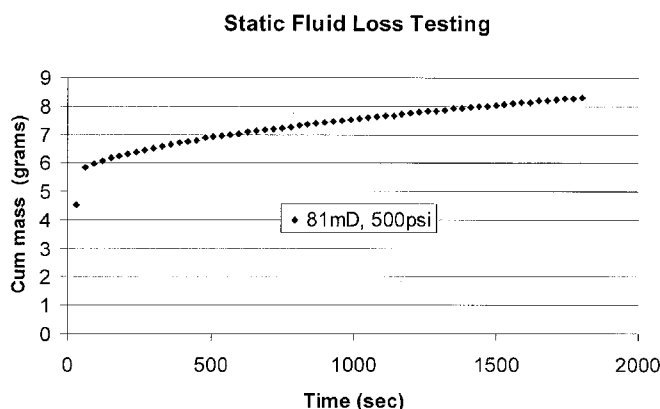
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[Continued on next page]

(54) Title: POLYMERIC MICROSPHERES AS DEGRADABLE FLUID LOSS ADDITIVES IN OILFIELD APPLICATIONS

Figure 1



(57) Abstract: Methods and apparatus for forming a fluid for use within in a subterranean formation including crosslinking a polymer along the surface of microspheres in a water-in-water emulsion and introducing the microspheres into the subterranean formation. Methods and apparatus for forming a fluid for use within in a subterranean formation including crosslinking a polymer along the surface of microspheres in a water in water emulsion, isolating the microspheres from the emulsion, and introducing the microspheres into the subterranean formation. Methods and apparatus for forming a fluid to treat a subterranean formation including introducing a crosslinkable polymer, partitioning agent, and crosslinker into a solvent, crosslinking the crosslinkable polymer, isolating beads of the crosslinkable polymer from the partitioning agent, introducing the beads into a fluid for treating a subterranean formation.



NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, 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.

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**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))

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10 September 2010

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/IB2010/050132

## A. CLASSIFICATION OF SUBJECT MATTER

INV. C09K8/512 C09K8/516 C09K8/68

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

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 practical, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2007/040537 A1 (RHODIA [US]) 12 April 2007 (2007-04-12) paragraphs [0013] - [0016] the whole document -----	1-18
A	US 2007/036977 A1 (SINCLAIR A R [US] ET AL) 15 February 2007 (2007-02-15) paragraphs [0022], [0 49] - [0051], [0 61] - [0069], [0 72] - [0086], [0111], [0112]; figure 3 the whole document -----	1-18
A	WO 98/22093 A1 (OCTOPLUS B V [NL]; HENNINK WILHELMUS EVERHARDUS [NL]; FRANSSEN OKKE [N]) 28 May 1998 (1998-05-28) abstract claims 1-9; figures 1,2 the whole document -----	1-18
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☒ Further documents are listed in the continuation of Box C.

☒ 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 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

19 April 2010

Date of mailing of the international search report

01/07/2010

Name and mailing address of the ISA/

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# INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2010/050132

## C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	WO 2009/104108 A1 (SCHLUMBERGER CA LTD [CA]; SCHLUMBERGER SERVICES PETROL [FR]; SCHLUMBER) 27 August 2009 (2009-08-27) the whole document -----	1-18
X,P	US 2009/205824 A1 (SULLIVAN PHILIP F [US] ET AL) 20 August 2009 (2009-08-20) the whole document -----	1-18

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IB2010/050132

### Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

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

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
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 No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

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

see additional 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 fees, this Authority did not invite payment of additional fees.
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.:

1-18

#### Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-18

1. A method of forming a fluid for use within in a subterranean formation, comprising:  
crosslinking a polymer along the surface of microspheres in a water-in-water emulsion; and  
introducing the microspheres into the subterranean formation.

7. A method of forming a fluid for use within in a subterranean formation, comprising:  
crosslinking a polymer along the surface of microspheres in a water in water emulsion;  
isolating the microspheres from the emulsion; and  
introducing the microspheres into the subterranean formation.

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2. claims: 19-27

A method for forming a fluid to treat a subterranean formation, comprising:  
introducing a crosslinkable polymer, partitioning agent, and crosslinker into a solvent;  
crosslinking the crosslinkable polymer;  
isolating beads of the crosslinkable polymer from the partitioning agent; and introducing the beads into a fluid for treating a subterranean formation.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No  
PCT/IB2010/050132

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 2007036977 A1	15-02-2007	US 7135231 B1	14-11-2006
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