



(51) International Patent Classification:

C02F 1/58 (2006.01) C08L 33/06 (2006.01)
C08F 20/10 (2006.01) C08L 33/26 (2006.01)
C08F 20/56 (2006.01)

(21) International Application Number:

PCT/US2011/031145

(22) International Filing Date:

5 April 2011 (05.04.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

12/754,683 6 April 2010 (06.04.2010) US

(71) Applicant (for all designated States except US): **NALCO COMPANY** [US/US]; 1601 W. Diehl Road, Naperville, Illinois 60563-1198 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ZINN, Paul J.** [US/US]; 1820 Stirling Lane, Montgomery, Illinois 60538 (US). **SHAH, Jitendra T.** [US/US]; 3148 Landore Drive, Naperville, Illinois 60564 (US). **ANDREWS, William J.** [US/US]; 1820 Stirling Lane, Montgomery, Illinois 60538 (US).

(74) Agents: **BISHOP, Joshua D.** et al.; 1601 W. Diehl Road, Naperville, Illinois 60563 (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, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, 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).

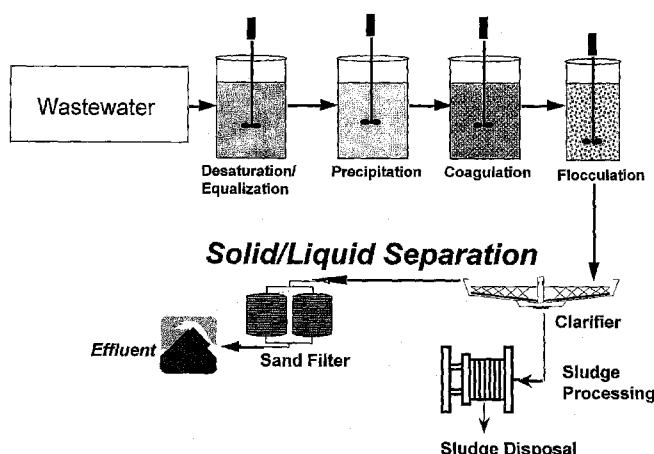
Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

[Continued on next page]

(54) Title: METAL SCAVENGING POLYMERS AND USES THEREOF

FIGURE 1
Physical-Chemical Method for Heavy Metal/Pollutant Removal



(57) Abstract: Uses for a composition comprising a polymer derived from at least two monomers: acrylic-x and an alkylamine, wherein said polymer is modified to contain a functional group capable of scavenging one or more compositions containing one or more metals are disclosed. These polymers have many uses in various mediums, including wastewater systems.

•Example treatment scheme based on treatment of flue gas desulphurization chloride purge from a power plant.





-
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))* — *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))*
- *of inventorship (Rule 4.17(iv))*

Published:

(88) Date of publication of the international search report:
12 January 2012

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

A. CLASSIFICATION OF SUBJECT MATTER*C02F 1/58(2006.01)i, C08F 20/10(2006.01)i, C08F 20/56(2006.01)i, C08L 33/06(2006.01)i, C08L 33/26(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)

C02F 1/58; C02F 1/26; C22B 3/00; C02F 1/52

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: acrylic, alkylamine, scavenge, metal, wastewater, remove

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008-0060997 A1 (MUSALE, DEEPAK A. et al.) 13 March 2008 See claims 1,5,10,11,15 ; abstract	1-14
A	US 2007-0248512 A1 (KAWAWA, BARAKA et al.) 25 October 2007 See claim 1	1-14
A	US 2005-0061750 A1 (FABRI, JON O. et al.) 24 March 2005 See claims1,8-12,26 ; abstract	1-14
A	US 2002-0121483 A1 (KRULIK, GERALD A.) 05 September 2002 See claims 1,2,4,10 ; column 4, lines 31-42 ; abstract	1-14

 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 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 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

21 NOVEMBER 2011 (21.11.2011)

Date of mailing of the international search report

21 NOVEMBER 2011 (21.11.2011)

Name and mailing address of the ISA/KR

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

Facsimile No. 82-42-472-7140

Authorized officer

Yi, Kyung Yul

Telephone No. 82-42-481-5602



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/031145

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008-0060997 A1	13.03.2008	AU 2007-292849 A1	13.03.2008
		CA 2663138 A1	13.03.2008
		CA 2687237 A1	13.03.2008
		CN 101511451 A	19.08.2009
		EP 2059332 A1	20.05.2009
		JP 2010-502436 A	28.01.2010
		KR 10-2009-0071583 A	01.07.2009
		US 2008-0060999 A1	13.03.2008
		US 2008-0197075 A1	21.08.2008
		WO 2008-030652 A1	13.03.2008
		WO 2008-030654 A1	13.03.2008
US 2007-0248512 A1	25.10.2007	AU 2007-243032 A1	08.11.2007
		CN 101432232 A	13.05.2009
		EP 2013147 A1	14.01.2009
		JP 2009-535200 A	01.10.2009
		KR 10-2008-0112321 A	24.12.2008
		KR20080112321A	24.12.2008
		TW 200808662 A	16.02.2008
		US 7722841 B2	25.05.2010
		WO 2007-127587 A1	08.11.2007
US 2005-0061750 A1	24.03.2005	None	
US 2002-0121483 A1	05.09.2002	AU 2002-11275 A1	08.04.2002
		TW 496754 A	01.08.2002
		US 6723246 B2	20.04.2004
		WO 02-26347 A1	04.04.2002