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- (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.
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(54) **Title:** HYDROGEN SULFIDE SCAVENGER FOR USE IN HYDROCARBONS

(57) **Abstract:** An effective hydrogen sulfide scavenger that produces little corrosion may be prepared by reacting glyoxal with a compound having at least two primary or secondary amine groups. The subject hydrogen sulfide scavengers may be used with both the production of crude oil and natural gas, and the refining of same.



A. CLASSIFICATION OF SUBJECT MATTER***B01J 20/22(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)

B01J 20/22; B01D 53/48; C02B 5/06; C02B 1/18; B01D 53/52; C07D 253/00

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: hydrogen sulfide, scavenger, glyoxal, polyamine, dispersant, hydrocarbon

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 05554349 A (GORDON T. RIVERS et al.) 10 September 1996 See abstract; claims 1-4	1-20
A	US 05698171 A (EDWARD A. TRAUFFER et al.) 16 December 1997 See abstract; claims 1-4	1-20
A	US 2009-0065445 A1 (GARY WESTLUND et al.) 12 March 2009 See abstract; claims 7-8, 10	1-20
A	US 04220550 A (WAYNE W. FRENIER et al.) 02 September 1980 See abstract; claims 1-7	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

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"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

28 DECEMBER 2012 (28.12.2012)

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02 JANUARY 2013 (02.01.2013)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 05554349 A	10.09.1996	GB 2286826 A US 05347004 A WO 94-08980 A1	30.08.1995 13.09.1994 28.04.1994
US 05698171 A	16.12.1997	AU 1997-16943 B2 CA 2240820 C CN 1133483 C0 CN 1207052 A0 EP 0877647 A2 EP 0877647 B1 JP 2001-508349 A WO 97-25126 A2	30.09.1999 19.03.2002 07.01.2004 03.02.1999 18.11.1998 05.06.2002 26.06.2001 17.07.1997
US 2009-0065445 A1	12.03.2009	US 2011-271835 A1 US 7985881 B2 WO 2009-035570 A2 WO 2009-035570 A3	10.11.2011 26.07.2011 19.03.2009 18.06.2009
US 04220550 A	02.09.1980	EP 0012478 A2 EP 0012478 A3 EP 0012478 B1 JP 1355230 C JP 55-079881 A JP 61-021314 B	25.06.1980 17.09.1980 20.02.1985 24.12.1986 16.06.1980 26.05.1986