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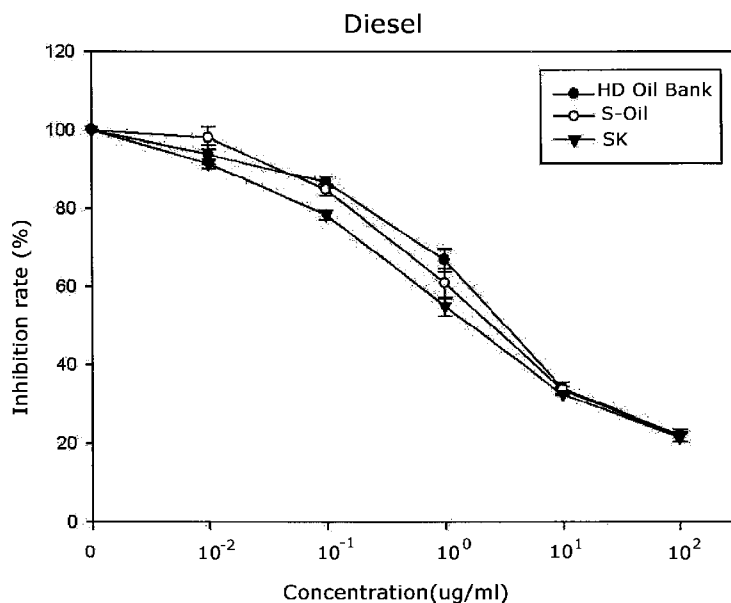
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151-872 (KR). **KONG, Seong Wook** [KR/KR]; Ga-102,
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[Continued on next page]

(54) Title: TRACING AND DETECTION METHOD OF OIL PRODUCT BY ENZYME-LINKED IMMUNOSORBENT AS-
SAY TECHNOLOGY

[Fig. 2]



(57) Abstract: Disclosed are a method for tracing and detecting oil products and a marker used for the same. More particularly, the method for tracing and detecting an oil product by enzyme-linked immunosorbent assay (ELISA), which includes adding a marker material that has both lipophilic and hydrophilic functional groups to an oil product; extracting the marker from the oil product using a surfactant; and detecting the extracted marker by ELISA using an antibody specific to the marker, is provided. According to the disclosure, a small amount of marker can be rapidly and quantitatively detected, thus being applied to a high speed oil product detection system with enhanced accuracy and high sensitivity.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2010/000676**A. CLASSIFICATION OF SUBJECT MATTER****G01N 33/22(2006.01)i, G01N 33/24(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)

G01N 33/22; C07K 16/44; G01N 31/00; G01N 33/26; G01N 33/577; G01N 33/58

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: marker, oil product, ELISA, lipophilic, hydrophilic

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5691148 A1 (STEPHEN B. FRIEDMAN et al.) 25 November 1997 See abstract and claims 1-16	1-8
A	KR 10-1989-0013478 A (BIOCODE INC.) 23 September 1989 See abstract and claims 1-17	1-8
A	JP 02-551486 B2 (SHIERU INTANASHIYO NAIL RESEARCH MARCH YAPPIE BEX.) 22 August 1996 See abstract and claims 1-10	1-8

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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INTERNATIONAL SEARCH REPORT

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5691148 A1	25.11.1997	EP 0672062 A1 WO 94-12536 A1	03.07.2002 09.06.1994
KR 10-1989-0013478 A	23.09.1989	AU 1994-76704 B2 CN 1037969 A CN 1071454 C CN 1107871 C CN 1131463 A CN 1308236 A0 EP 0327163 A2 EP 0409842 A1 EP 0714512 A1 GB 2234588 A JP 02-551486 B2 JP 02-559069 B JP 09-504099 A JP 1227059 A KR 10-1996-0704230 A US 5429952 A1 US 5776713 A1 WO 89-07272 A1 WO 95-06249 A1	14.01.1999 13.12.1989 19.09.2001 07.05.2003 18.09.1996 15.08.2001 09.08.1989 30.01.1991 05.06.1996 06.02.1991 22.08.1996 05.09.1996 22.04.1997 11.09.1989 31.08.1996 04.07.1995 07.07.1998 10.08.1989 02.03.1995
JP 02-551486 B2	22.08.1996	AT 122466 T AU 1994-76704 B2 CN 1037969 A CN 1071454 C CN 1107871 C CN 1131463 A CN 1308236 A0 DE 68922606 D1 EP 0327163 A2 EP 0409842 A1 EP 0714512 A1 GB 2234588 A GB 8802838 D0 GB 9017364 D0 HK 207796 A JP 02-559069 B JP 09-504099 A JP 1227059 A JP 2559069 B2 JP 3502487 T KR 10-0150193 B1 KR 10-1996-0704230 A US 5429952 A1 US 5776713 A1 WO 89-07272 A1 WO 95-06249 A1	15.05.1995 14.01.1999 13.12.1989 19.09.2001 07.05.2003 18.09.1996 15.08.2001 14.06.1995 09.08.1989 30.01.1991 05.06.1996 06.02.1991 09.03.1988 21.11.1990 29.11.1996 05.09.1996 22.04.1997 11.09.1989 27.11.1996 06.06.1991 01.12.1998 31.08.1996 04.07.1995 07.07.1998 10.08.1989 02.03.1995