

Title (en)

ADDITIVES TO REDUCE METAL PICK-UP IN FUELS

Title (de)

ADDITIVE ZUR VERMINDERUNG DER METALLAUFNAHME IN BRENNSTOFFEN

Title (fr)

ADDITIFS POUR CARBURANTS PERMETTANT DE RÉDUIRE L'ARRACHEMENT DE MÉTAL

Publication

EP 3127992 A1 20170208 (EN)

Application

EP 16185196 A 20091001

Priority

- US 10430408 P 20081010
- EP 09737254 A 20091001
- US 2009059164 W 20091001

Abstract (en)

The present invention relates to fuel additives, fuel additive compositions and fuel compositions, as well as a method for fueling an internal combustion engine, providing reduced metal pick-up by fuels where the compositions of the present invention contain a hydrocarbon substituted with at least two carboxy functionalities in the form of acids or at least one carboxy functionality in the form of an anhydride.

IPC 8 full level

C10L 1/14 (2006.01); **C10L 1/188** (2006.01); **C10L 1/198** (2006.01); **C10L 10/00** (2006.01); **C10L 10/04** (2006.01); **C10L 1/222** (2006.01); **C10L 1/2383** (2006.01)

CPC (source: EP KR US)

C10L 1/14 (2013.01 - KR); **C10L 1/143** (2013.01 - EP US); **C10L 1/188** (2013.01 - KR); **C10L 1/1883** (2013.01 - EP US); **C10L 1/198** (2013.01 - EP KR US); **C10L 10/00** (2013.01 - EP US); **C10L 10/04** (2013.01 - EP KR US); **C10L 1/2222** (2013.01 - EP US); **C10L 1/2383** (2013.01 - EP US)

Citation (applicant)

- US 4234435 A 19801118 - MEINHARDT NORMAN A, et al
- US 4108889 A 19780822 - CONNOR DANIEL STEDMAN
- US 3412111 A 19681119 - IRWIN PHILIP G, et al
- US 3172892 A 19650309
- US 3215707 A 19651102 - RENSE RUDOLPH J
- US 3219666 A 19651123
- US 3231587 A 19660125 - RENSE RUDOLPH J
- US 3912764 A 19751014 - PALMER JR JOHN F
- US 4110349 A 19780829 - COHEN JEROME MARTIN
- GB 1440219 A 19760623 - COOPER LTD ETHYL
- US 5739356 A 19980414 - DIETZ JEFFERY G [US], et al
- US 5777142 A 19980707 - ADAMS PAUL E [US], et al
- US 5786490 A 19980728 - DIETZ JEFFERY G [US], et al
- US 5856524 A 19990105 - DIETZ JEFFERY G [US], et al
- US 6020500 A 20000201 - BAKER MARK R [US], et al
- US 6114547 A 20000905 - BAKER MARK R [US], et al
- US 5912213 A 19990615 - BAKER MARK R [US], et al
- US 5851966 A 19981222 - BAKER MARK R [US], et al
- US 5885944 A 19990323 - PUDELSKI JOHN K [US], et al
- EP 0355895 A2 19900228 - SHELL INT RESEARCH [NL]
- US 3634515 A 19720111 - PIASEK EDMUND J, et al
- EP 0279863 A1 19880831 - MITSUI PETROCHEMICAL IND [JP]
- US 3598738 A 19710810 - BISWELL CHARLES B, et al
- US 4026809 A 19770531 - LACHOWICZ DONALD R, et al
- US 4032700 A 19770628 - SONG WON R, et al
- US 4137185 A 19790130 - GARDINER JOHN B, et al
- US 4156061 A 19790522 - JACOBSON NORMAN [US], et al
- US 4320019 A 19820316 - HAYASHI KATSUMI
- US 4357250 A 19821102 - HAYASHI KATSUMI
- US 4658078 A 19870414 - SLAUGH LYNN H [US], et al
- US 4668834 A 19870526 - RIM YONG S [US], et al
- US 4937299 A 19900626 - EWEN JOHN A [US], et al
- US 5324800 A 19940628 - WELBORN JR HOWARD C [US], et al
- US 5071919 A 19911210 - DEGONIA DAVID J [US], et al
- US 5137978 A 19920811 - DEGONIA DAVID J [US], et al
- US 5137980 A 19920811 - DEGONIA DAVID J [US], et al
- US 5286823 A 19940215 - RATH HANS P [DE]
- US 5408018 A 19950418 - RATH HANS P [DE]
- US 6562913 B1 20030513 - BAXTER JR C EDWARD [US], et al
- US 6683138 B2 20040127 - BAXTER JR C EDWARD [US], et al
- US 7037999 B2 20060502 - BAXTER JR C EDWARD [US], et al
- US 2004176552 A1 20040909 - BAXTER C EDWARD [US]
- US 2005137363 A1 20050623 - BAXTER C E JR [US], et al
- US 2006079652 A1 20060413 - BAXTER C E JR [US], et al
- US 3361673 A 19680102 - STUART FRANK A, et al
- US 3401118 A 19680910 - BENOIT JR GEORGE J
- US 3087436 A 19630430 - DETTLOF LEE A, et al
- US 3272746 A 19660913 - LE SUER WILLIAM M, et al

- US 6077909 A 20000620 - PUDELSKI JOHN K [US], et al
- US 6165235 A 20001226 - KOLP CHRISTOPHER J [US], et al
- US 4253980 A 19810303 - HAMMOND KENNETH G, et al
- US 3778371 A 19731211 - MALEC R
- US 4171959 A 19791023 - VARTANIAN PAUL F [US]
- US 4326973 A 19820427 - HAMMOND KENNETH G, et al
- US 4338206 A 19820706 - HAMMOND KENNETH G, et al
- US 5254138 A 19931019 - KUREK PAUL R [US]
- KIRK; OTHMER: "Encyclopedia of Chemical Technology", 1971, INTERSCIENCE PUBLISHERS, DIV. OF JOHN WILEY AND SON, pages: 632,657
- BEN ET AL.: "The Ene Reaction of Maleic Anhydride With Alkenes", J.C.S. PERKIN II, 1977, pages 535 - 537

Citation (search report)

- [XA] US 3282836 A 19661101 - MILLER JAMES R, et al
- [XA] US 4531948 A 19850730 - KNAPP GORDON G [US]
- [XA] WO 2007062304 A2 20070531 - NOVUS INT INC [US], et al
- [A] EP 1884556 A2 20080206 - INFINEUM INT LTD [GB]

Cited by

US11174442B2; WO2018178672A1

Designated contracting state (EPC)

AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

DOCDB simple family (publication)

WO 2010042378 A1 20100415; AU 2009302649 A1 20100415; AU 2016204848 A1 20160728; AU 2017251765 A1 20171116; AU 2017251765 B2 20190509; BR 122018075929 B1 20220927; BR PI0920665 A2 20180626; BR PI0920665 B1 20220920; CA 2739432 A1 20100415; CA 2739432 C 20181204; CA 3025740 A1 20100415; CA 3025740 C 20211109; CN 102239238 A 20111109; CN 106753620 A 20170531; DK 2385977 T3 20161017; DK 2385977 T4 20200309; DK 3127992 T3 20190318; EP 2385977 A1 20111116; EP 2385977 B1 20160824; EP 2385977 B2 20200101; EP 3127992 A1 20170208; EP 3127992 B1 20181212; EP 3486300 A1 20190522; JP 2012505291 A 20120301; JP 2013234336 A 20131121; JP 2015147942 A 20150820; JP 2017101259 A 20170608; JP 6046347 B2 20161214; KR 101722272 B1 20170331; KR 20110069846 A 20110623; PL 2385977 T3 20170228; PL 2385977 T5 20200727; PL 3127992 T3 20190628; SG 194415 A1 20131129; US 2011219674 A1 20110915

DOCDB simple family (application)

US 2009059164 W 20091001; AU 2009302649 A 20091001; AU 2016204848 A 20160711; AU 2017251765 A 20171025; BR 122018075929 A 20091001; BR PI0920665 A 20091001; CA 2739432 A 20091001; CA 3025740 A 20091001; CN 200980148703 A 20091001; CN 201710063619 A 20091001; DK 09737254 T 20091001; DK 16185196 T 20091001; EP 09737254 A 20091001; EP 16185196 A 20091001; EP 18211764 A 20091001; JP 2011531069 A 20091001; JP 2013172919 A 20130823; JP 2015107040 A 20150527; JP 2017040410 A 20170303; KR 20117010466 A 20091001; PL 09737254 T 20091001; PL 16185196 T 20091001; SG 2013075635 A 20091001; US 200913121714 A 20091001