

Title (en)  
FUEL COMPOSITION

Title (de)  
KRAFTSTOFFZUSAMMENSETZUNG

Title (fr)  
COMPOSITION DE CARBURANT

Publication  
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Application  
**EP 10180913 A 20040408**

Priority  
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Abstract (en)  
[origin: CA2520578A1] Disclosed is a fuel composition containing a major quantity of gasoline having a maximum sulfur content of 150 ppm by weight, and a minor quantity of at least one gasoline additive having a detergent effect or a valve seat wear-inhibiting effect. Said gasoline additive comprises at least one hydrophobic hydrocarbon radical having an average molecular weight of 85 to 20,000, and at least one polar group. The fuel composition further contains at least one low alkanol at a moiety of about 5 to 75 percent by volume.

IPC 8 full level  
**C10L 1/14** (2006.01); **C10L 10/00** (2006.01); **C10L 1/18** (2006.01); **C10L 1/22** (2006.01)

CPC (source: EP KR US)  
**C10L 1/14** (2013.01 - KR); **C10L 1/143** (2013.01 - EP US); **C10L 10/08** (2013.01 - EP US); **C10L 1/1824** (2013.01 - EP US);  
**C10L 1/2383** (2013.01 - EP US)

Citation (opposition)  
Opponent : Afton Chemical Corporation  
• EP 1481041 A1 20041201 - SHELL INT RESEARCH [NL]  
• CA 2359723 A1 20000817 - BASF AG [DE]  
• CA 2406762 A1 20021017 - BASF AG [DE]  
• DE 10109260 A1 20020905 - BASF AG [DE]  
• US 2003029077 A1 20030213 - JACKSON MITCHELL M [US], et al  
• US 4398921 A 19830816 - RIFKIN ELLIS B [US], et al  
• WO 0123440 A1 20010405 - LUBRIZOL CORP [US]  
• US 5089028 A 19920218 - ABRAMO GUY P [US], et al  
• US 5725612 A 19980310 - MALFER DENNIS J [US], et al  
• EP 1615985 A1 20060118 - BASF AG [DE]  
• ANONYMOUS: "Environmental Protection Agency r : 40 CFR Part 80 Regulation of Fuels and Fuel Additives Certification Standards for Deposit Control Gasoline Additives; Final Rule", FED. REG., vol. 61, no. 130, 5 July 1996 (1996-07-05), pages 35310 - 35381, XP055965382  
• SHILBOLM ET AL.: "Effect on Intake Valve Deposits of Ethanol and Additives Common to the Available Ethanol Supply", SAE TECHNICAL PAPER SERIES 902109, 22 October 1990 (1990-10-22), Tulsa, Oklahoma, pages 1 - 6, XP055966392  
• ANONYMOUS: "Federal register / vol. 58, No. 232 / Monday, December 6, 1993 / proposed rules", FEDERAL REGISTER, vol. 58, no. 232, 6 December 1993 (1993-12-06), pages 64101 - 64364, XP055966604  
• "Automotive Fuels Handbook", 1990, article OWEN ET AL.: "Chapter 11 - Oxygenated Blend Components for Gasoline", pages: 221 - 259, XP055298955  
• "Handbook On Bioethanol Production and Utilization", 1996, TAYLOR AND FRANCIS, article WYMAN ET AL.: "Chapter 3", pages: 54 - 55, XP055965417  
• DEPARTMENT OF ENERGY UNITED STATES OF AMERICA: "Handbook for Handling, Storing, and Dispensing E85", HANDLING, STORING, AND DISPENSING, 1 February 2002 (2002-02-01), pages 1 - 31, XP055966583  
• VILARDO JONATHAN S., ARTERS DAVID, CORKWELL KEITH, CERDA DE GROOTE CARLOS L.: "A Comprehensive Examination of the Effect of Ethanol-Blended Gasoline on Intake Valve Deposits in Spark-Ignited Engines", SAE 2007-01-3 995, 29 October 2007 (2007-10-29), pages 1 - 14, XP055966614  
• SCHWAHN ET AL.: "Deposit formation of flex fuel engines operated on ethanol and gasoline blends", SAE 2010-01-14 64, 5 May 2010 (2010-05-05), pages 1 - 16, XP055966621  
• VÖLKEL ET AL.: "Experience with Bio-ethanol Gasoline Blends", GORIVA I MAZIVA, vol. 46, no. 4, 2007, pages 307 - 334, XP055298945  
• HWANG HO-LING, ET AL.: "The Federal Highway Administration Gasohol Consumption Estimation Model ORNL/TM- 2003/210", OAK RIDGE NATIONAL LABORATORY, August 2003 (2003-08-01), pages 1 - 83, XP055966464  
• GUO ET AL.: "Synthesis and performance evaluation of a new type of adducts of polyisobutyl phenolepoxy chloropropane-polyamine as gasoline detergents", PETROLEUM CHEMISTRY DIVISION PREPRINTS, vol. 47, no. 2, 2002, pages 139, XP055966625  
• RF HAYCOCK ET AL.: "Fuel Additives and the Environment", ATC, 1994, pages 1 - 39, XP055298972  
• ARADI ET AL.: "The effect of fuel composition, engine operating parameters and additive content on injector deposits in a high-pressure direct injection gasoline (DIG) research engine", AACHENER KOLLOQUIUM FAHRZEUG- UND MOTORENTECHNIK, 2000, pages 187 - 211, XP055966634  
• "Air Pollution Control Law: Compliance & Enforcement", 2001, article REITZE JR. A. W.: "Chapter Eleven - The regulation of fuels and fuel additives", pages: 334 - 337, XP055965456  
Opponent : Innospec Limited  
• WO 03076554 A1 20030918 - SHELL INT RESEARCH [NL], et al  
• WO 03074637 A1 20030912 - BASF AG [DE], et al  
• CA 2406762 A1 20021017 - BASF AG [DE]  
• CA 2359723 A1 20000817 - BASF AG [DE]  
• WO 0123440 A1 20010405 - LUBRIZOL CORP [US]  
• US 5089028 A 19920218 - ABRAMO GUY P [US], et al  
• DE 10109260 A1 20020905 - BASF AG [DE]  
• 055965382: "Environmental Protection Agency r : 40 CFR Part 80 Regulation of Fuels and Fuel Additives Certification Standards for Deposit Control Gasoline Additives; Final Rule", FEDERAL REGISTER, vol. 61, no. 130, 5 July 1996 (1996-07-05), pages 35309 - 35381, XP055965382

- C A SHILBOLM ET AL.: "Effect on Intake Valve Deposits of Ethanol and Additives Common to the Available Ethanol Supply", SAE TECHNICAL PAPER SERIES, 22 October 1990 (1990-10-22), Tulsa, Oklahoma, pages 1 - 6, XP055966392
- DEPARTMENT OF ENERGY UNITED STATES OF AMERICA: "Handbook for Handling, Storing and Dispensing E85", April 2002, article DEPARTMENT OF ENERGY UNITED STATES OF AMERICA, pages: 1 - 31, XP055966583
- ANONYMOUS: "Automotive fuels - unleaded petrol - requirements and test methods; German version EN 228: 1999", DIN, February 2000 (2000-02-01), pages 1 - 14, XP055966555
- ANONYMOUS: "Air and Radiation, Regulatory Announcement, EPA's Program for Cleaner Vehicles and Cleaner gasoline", EPA420-F-99- 051 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, December 1999 (1999-12-01), pages 1 - 4, XP055966501
- ANONYMOUS: "Worldwide Fuel Charter", JAMA, December 2002 (2002-12-01), pages 1 - 49, XP055966416
- ANONYMOUS: "RFG Property and Performance Averages for Chicago-Lake Co., IL, Gary, IN", 27 November 2012 (2012-11-27), pages 1 - 2, XP055966413, Retrieved from the Internet <URL:http://www.epa.gov/otaq/fuels/gasolinefuels/rfg/properf/chi-il.htm>
- "Automotive Gasoline Direct-Injection Engines", 2002, ISBN: 978-0-7680-0882-1, article ZHAO ET AL.: "Emissions: formation mechanisms and reduction strategies", pages: 247, XP055966410
- ANONYMOUS: "Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and Council Directive 93/12/EEC", OFFICIAL JOURNAL OF THE EUROPEAN COMMUNITIES, 13 October 1998 (1998-10-13), pages 1 - 10, XP05596656
- ARNOLD W REITZE JR: "Air Pollution Control law Compliance & Enforcement", ENVIRONMENTAL LAW INSTITUTE, 2001, pages 334 - 337, XP055966491
- VÖLKEL ET AL.: "Experience with Bio-ethanol Gasoline Blends", GORIVA I MAZIVA, vol. 46, no. 4, 2007, pages 307 - 334, XP055298945
- HAYCOCK R. F., ET AL.: "Fuel Additives and the Environment", ATC, 1994, pages 1 - 42, XP055298972
- "Automotive fuels handbook", 1990, article OWEN ET AL.: "Chapter 11: Oxygenated blend components for gasoline", pages: 221 - 259, XP055298955
- WYMAN; ET AL: "Handbook on Bioethanol Production and Utilization", 1996, TAYLOR AND FRANCIS, article "Chapter 3", pages: 54 - 55, XP055965417
- HWANG HO-LING, ET AL.: "The Federal Highway Administration Gasohol Consumption Estimation Model ORNL/TM- 2003/210", OAK RIDGE NATIONAL LABORATORY, August 2003 (2003-08-01), pages 1 - 83, XP055966464
- ANONYMOUS: "Produkt: Keropur G", BASF, 28 June 2018 (2018-06-28), pages 1 - 14, XP055966484

Opponent : The Lubrizol Corporation

- US 5089028 A 19920218 - ABRAMO GUY P [US], et al
- WO 0142399 A1 20010614 - ETHYL CORP [US], et al
- EP 0905217 A1 19990331 - NIPPON OIL CO LTD [JP]
- US 4398921 A 19830816 - RIFKIN ELLIS B [US], et al
- WO 9424231 A1 19941027 - BASF AG [DE], et al
- EP 0244616 A2 19871111 - BASF AG [DE]
- EP 0310875 A1 19890412 - BASF AG [DE]
- EP 0356725 A1 19900307 - BASF AG [DE]
- EP 0700985 A1 19960313 - BASF AG [DE]
- US 4877416 A 19891031 - CAMPBELL CURTIS B [US]
- US 4849572 A 19890718 - CHEN FRANK J [US], et al
- EP 0831141 A1 19980325 - BP CHEMICALS ADDITIVES [GB]
- WO 9533022 A1 19951207 - ORR WILLIAM C [US]
- WO 9603367 A1 19960208 - BASF AG [DE], et al
- EP 0476485 A1 19920325 - BASF AG [DE]
- EP 0307815 A1 19890322 - BASF AG [DE]
- EP 0639632 A1 19950222 - OEMV AG [AT]
- DE 3838918 A1 19900523 - BASF AG [DE]
- WO 0185874 A2 20011115 - BASF AG [DE], et al
- WO 0123440 A1 20010405 - LUBRIZOL CORP [US]
- US 5679118 A 19971021 - JARVIS DAVID A [US], et al
- WO 03076554 A1 20030918 - SHELL INT RESEARCH [NL], et al
- ANONYMOUS: "Petroleum chronology of events 1970 - 2000", PETROLEUM CHRONOLOGY OF EVENTS, 1970, pages 1 - 14, XP055966647, Retrieved from the Internet <URL:http://www.eia.gov/pub/oilgas/petroleum/analysis/publications/chronology/petroleumchronology2000.htm>
- ANONYMOUS: "EU: Fuels: Diesel and Gasoline", TRANSPORTPOLICY.NET, 2014, pages 1 - 5, XP055966649, Retrieved from the Internet <URL:http://transportpolicy.net/index.php?title=EU: Fuels: Diesel and Gasoline>
- ANONYMOUS: "Gasoline Fuel specification for EU", INTERNATIONAL FUEL QUALITY CENTER, 1995, pages 1, XP055966650, Retrieved from the Internet <URL:www.ifqc.org:InternationalFuelQualityCenter>
- NIKOLAS HILL: "EU Fuel Quality Monitoring - 2001 Summary Report", AEA TECHNOLOGY ENVIRONMENT AEAT/ED50196/R1 FINAL, June 2003 (2003-06-01), pages 1, XP055966651
- ANONYMOUS: "Gasoline Fuel specification for United States", INTERNATIONAL FUEL QUALITY CENTER, 2000, pages 1, XP055966655, Retrieved from the Internet <URL:www.ifqc.org:InternationalFuelQualityCenter>
- ANONYMOUS: "A Summary of Worldwide Automotive Fuel Specifications", IFQC, January 2002 (2002-01-01), pages 4 - 5, 14-15, XP055966658
- CARLISLE HUGE W., ET AL.: "The effect of fuel composition and additive content on injector deposits and performance of an air-assisted direct injection spark ignition (DISI) research engine", SOCIETY OF AUTOMOTIVE ENGINEERS, INC, 2001, pages 1549 - 1565, XP055966664
- ANONYMOUS: "California Phase 2 Reformulated Gasoline Specifications", CALIFORNIA AIR RESOURCES BOARD, vol. 1, 4 October 1991 (1991-10-04), pages 1 - 152, XP055966665
- DEPARTMENT OF ENERGY UNITED STATES OF AMERICA: "Handbook for Handling, Storing, and Dispensing E85", HANDBOOK FOR HANDLING, STORING, AND DISPENSING, February 2002 (2002-02-01), pages 1 - 31, XP055966583
- ANONYMOUS: "Regulation of Fuels and Fuel Additives; Definition of Substantially Similar", EPA REGULATION OF FUEL REVISED, 9 March 1990 (1990-03-09), pages 1 - 12, XP055966668
- ANONYMOUS: "History of ethanol fuel in Brazil", WIKIPEDIA, 1 August 2021 (2021-08-01), pages 1 - 16, XP055966666

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AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR

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**DE 10316871 A1 20041021**; AR 044001 A1 20050824; AU 2004227095 A1 20041021; AU 2004227095 B2 20100715; BR P10409171 A 20060411; CA 2520578 A1 20041021; CA 2520578 C 20130618; CA 2810284 A1 20041021; CA 2810284 C 20150616; CL 2004000766 A1 20050204; CN 100545244 C 20090930; CN 1802425 A 20060712; DK 1615985 T3 20140303; EP 1615985 A1 20060118; EP 1615985 B1 20131211; EP 2270119 A1 20110105; EP 2270119 B1 20200715; EP 3736317 A1 20201111; ES 2443993 T3 20140221; JP 2006522846 A 20061005; JP 2010013665 A 20100121; JP 2013209664 A 20131010; JP 4452712 B2 20100421; KR 101186408 B1 20120927; KR 201320732 B1 20131021; KR 20060006781 A 20060119; KR 20120081230 A 20120718; MX PA05010183 A 20051108; MY 162483 A 20170615; NO 20054374 L 20050929; PL 1615985 T3 20140530; PL 2270119 T3 20210125; PT 1615985 E 20140129;

RU 2005134823 A 20060610; SI 1615985 T1 20140228; US 2006196110 A1 20060907; WO 2004090079 A1 20041021;  
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**DE 10316871 A 20030411**; AR P040101182 A 20040407; AU 2004227095 A 20040408; BR PI0409171 A 20040408; CA 2520578 A 20040408;  
CA 2810284 A 20040408; CL 2004000766 A 20040408; CN 200480009761 A 20040408; DK 04726498 T 20040408; EP 04726498 A 20040408;  
EP 10180913 A 20040408; EP 2004003811 W 20040408; EP 20174630 A 20040408; ES 04726498 T 20040408; JP 2006505086 A 20040408;  
JP 2009240064 A 20091019; JP 2013121995 A 20130610; KR 20057018049 A 20040408; KR 20127014391 A 20040408;  
MX PA05010183 A 20040408; MY PI20041114 A 20040329; NO 20054374 A 20050921; PL 04726498 T 20040408; PL 10180913 T 20040408;  
PT 04726498 T 20040408; RU 2005134823 A 20040408; SI 200432123 T 20040408; US 55123905 A 20050928; ZA 200509086 A 20051110