

Title (en)

Copolymers based on olefins and ethylenically unsaturated carboxylic acid esters as pour point depressants for fuels and lubricants

Title (de)

Copolymere auf Basis von Olefinen und Estern von ethylenisch ungesättigten Carbonsäuren zur Erniedrigung des CP-Werts von Brennstoffölen und Schmierstoffen

Title (fr)

Copolymères à base d'oléfines et d'esters d'acides carboxyliques éthyléniquement insaturés pour abaisser le point de trouble des combustibles et des lubrifiants

Publication

EP 1746146 A1 20070124 (DE)

Application

EP 05015991 A 20050722

Priority

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Abstract (en)

New copolymer (I) is derived from monomers comprising M1, M2, optionally M3 and optionally M4, where M1 is a mono- or diester of (substituted) maleic or fumaric acid, M2 and M3 are different 2-50 carbon olefins and M4 is (substituted) maleic anhydride. New copolymer (I) is derived from monomers comprising M1, M2, optionally M3 and optionally M4, where M1 is a mono- or diester of (substituted) maleic or fumaric acid of formula (M1), M2 and M3 are different 2-50 carbon olefins and M4 is (substituted) maleic anhydride of formula (M4): [Structures (M1), line 21, and structures (M4), line 41, claim 1, page 18] R1>, R2>H or 1-4 C hydrocarbyl in one case and -COOR5> in the other; R3>, R4>H or 1-4 C hydrocarbyl in one case and -COOR6> in the other; R5>H or 1-40 C hydrocarbyl; R6>1-40 C hydrocarbyl; R7>, R8>H or 1-4 C hydrocarbyl. Independent claims are included for the following: (1) use of a copolymer (I) for as cloud point depressant (CPD) for fuel oils and lubricants; (2) fuel oil composition containing a major weight fraction of middle distillate fuel boiling in the 120-500[deg]C range and a minor fraction of copolymer(s) (I); (3) lubricant composition containing a major weight fraction of a conventional lubricant and a minor fraction of (I); (4) additive package containing (I) in combination with other conventional lubricant or fuel oil additive(s).

IPC 8 full level

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CPC (source: EP)

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Citation (applicant)

- WO 0104238 A1 20010118 - EQUISTAR CHEM LP [US]
- EP 0214786 A1 19870318 - EXXON CHEMICAL PATENTS INC [US]
- EP 0813550 A1 19971229 - AKZO NOBEL NV [NL]
- EP 0061895 A2 19821006 - EXXON RESEARCH ENGINEERING CO [US]
- US 4491455 A 19850101 - ISHIZAKI TAKAHARU [JP], et al
- WO 0044857 A2 20000803 - INFINEUM USA LP [US], et al
- DE 19848621 A1 20000427 - BASF AG [DE]
- DE 19622052 A1 19971204 - BASF AG [DE]
- EP 0398101 B1 19930804
- EP 0261957 A2 19880330 - EXXON CHEMICAL PATENTS INC [US]
- N. A. PLATÉ; V. P. SHIBAEV: "Comb-Like Polymers. Structure and Properties", J. POLY. SCI. MACROMOLECULAR REV., vol. 8, 1974, pages 117 - 253

Citation (search report)

- [X] US 6458174 B1 20021001 - KRULL MATTHIAS [DE], et al
- [DX] EP 0214786 A1 19870318 - EXXON CHEMICAL PATENTS INC [US]
- [X] EP 1541664 A1 20050615 - CLARIANT GMBH [DE]
- [A] EP 0306290 A1 19890308 - EXXON CHEMICAL PATENTS INC [US]

Cited by

US11028334B2

Designated contracting state (EPC)

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