

[SS 21] (drag or friction) and (plastic+ or solvent or lubric+ or soft+ or glycol) and polymer and reduc+

Results in EPODOC 585

[SS 22] 21 and (oil or hydrocarbon or pump or fluid)

Results in EPODOC 211

[SS 23] 22 and (acrylat+ or metacrilat+ or styrene or acrylic)

Results in EPODOC 23

[SS 24] 23 and (amine or glycol or plastic+ or ratio or weight or ppm or toluene)

Results in EPODOC 20

[SS 25] ..li



1/20 © EPODOC / EPO

PN - [CN107129850](#) A 20170905

PR - CN20171263086 20170421

AP - CN20171263086 20170421

DT - I

PA - SICHUAN CARBON WORLD TECH CO LTD

TI - SEBS (**Styrene** Isoprene Block **Polymer**) modified graphite **lubricating oil** and preparation method thereof

AB - The invention discloses an SEBS (**Styrene** Isoprene Block **Polymer**) modified graphite **lubricating oil** and a preparation method thereof, and belongs to the technical field of **lubricating oil**. The preparation method comprises the following steps: firstly, activating graphene oxide flakes with SOCl₂, and further performing esterification reaction with propargyl alcohol so as to obtain alkynylated graphene oxide; performing click reaction on a triblock copolymer of azidated poly (**styrene**-ethylene-butene-**styrene**) so as to generate a functionally modified compound SEBS-C-GOS of SEBS and graphene oxide; adding the obtained SEBS-c-GOS in different mass ratios into base **oil**, performing ball milling, further adding a dispersing agent of which the mass **ratio** is 0.01-2%, an emulsifier of which the mass **ratio** is 0.01-1%, performing ball milling for 10 minutes, performing ultrasonic dispersion for 20 minutes, and further sufficiently stirring, thereby obtaining a finished product of **lubricating oil**. By adopting the **lubricating oil** disclosed by the invention, due to addition of additives prepared by using a special method, the noise of an engine can be remarkably **reduced**, mechanical energy consumption caused by **friction** of the engine is **reduced**, and the power output of the engine is increased.

2/20 © EPODOC / EPO

PN - [JP2015013961](#) A 20150122

PNFP - JP6113004B B2 20170412

PR - JP20130142021 20130705

AP - JP20130142021 20130705

DT - I

CT - || STSE (A)
[JP2009534521](#) A 20090924 [];
[WO2006009083](#) A1 20060126 [] (KURARAY CO [JP], et al);
[JPH0948988](#) A 19970218 [] (SANYO CHEMICAL IND LTD);
[JP2005187736](#) A 20050714 [] (SANYO CHEMICAL IND LTD);
[JP2009536686](#) A 20091015 [];
[JP2009074068](#) A 20090409 [] (SANYO CHEMICAL IND LTD);
[WO2012076676](#) A1 20120614 [] (EVONIK ROHMAX ADDITIVES GMBH [DE], et al);
[JP2004513997](#) A 20040513 [];
[US2012245068](#) A1 20120927 [] (SCANLON EUGENE [US], et al);
[US2007244018](#) A1 20071018 [] (VISGER DANIEL C [US], et al);
[US2010167970](#) A1 20100701 [] (STOEHR TORSTEN [DE], et al);
[US2009118150](#) A1 20090507 [] (BAUM MARINA [US], et al)

FI - C10M101/02; C10M145/14; C10N20/04; C10N30/00&Z; C10N30/02; C10N30/06; C10N40/04

FT - 4H104/BA02A; 4H104/BA04A; 4H104/BA07A; 4H104/BB33A; 4H104/BB34A; 4H104/CB08C; 4H104/DA02A; 4H104/EA03C; 4H104/EB05; 4H104/LA03; 4H104/LA20; 4H104/PA02; 4H104/PA03

PA - (A)
JX NIPPON OIL & ENERGY CORP

TI - (A)
POLY(METH)ACRYLATE-BASED VISCOSITY INDEX IMPROVER, AND **LUBRICATING OIL** ADDITIVE AND **LUBRICATING OIL** COMPOSITION CONTAINING VISCOSITY INDEX IMPROVER

AB - (A)
PROBLEM TO BE SOLVED: To provide a viscosity index improver which can impart a sufficient **friction** loss **reducing** effect to a **lubricating oil** and is excellent in shear stability and to provide a **lubricating oil** additive and a **lubricating oil** composition containing the viscosity index improver.SOLUTION: There is provided a poly(meth) **acrylate**-based viscosity index improver which has a core and three or more arms which are composed of a **polymer** chain containing a structural unit represented by the following general formula (1) and in which one end of the **polymer** chain is bonded to the core, where the **weight** average molecular **weight** (Mw) of the poly(meth)**acrylate**-based viscosity index improver is less than 100000 and the **ratio** (Mw/Mn) between the **weight** average molecular **weight** (Mw) and the number average molecular **weight** (Mn) is 1.6 or less.

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PN - [JP2015013960](#) A 20150122

PNFP - JP6077954B B2 20170208

PR - JP20130142019 20130705

AP - JP20130142019 20130705

DT - I

CT - || STSE (A)
[JP2009506179](#) A 20090212 [];
[JP2009534521](#) A 20090924 [];
[JP2000063439](#) A 20000229 [] (ETHYL CORP [US]);
[WO2006009083](#) A1 20060126 [] (KURARAY CO [JP], et al);
[JPH0948988](#) A 19970218 [] (SANYO CHEMICAL IND LTD);
[JP2009536686](#) A 20091015 [];
[JP2009074068](#) A 20090409 [] (SANYO CHEMICAL IND LTD);
[WO2012076676](#) A1 20120614 [] (EVONIK ROHMAX ADDITIVES GMBH [DE], et al);
[JP2004513997](#) A 20040513 [];
[US2012245068](#) A1 20120927 [] (SCANLON EUGENE [US], et al);
[JP2012041559](#) A 20120301 [] (LUBRIZOL CORP);
[JP2005187736](#) A 20050714 [] (SANYO CHEMICAL IND LTD);
[JP2008518051](#) A 20080529 [];
[JP2008518052](#) A 20080529 [];
[WO2007127615](#) A2 20071108 [] (LUBRIZOL CORP [US], et al);
[US2010167970](#) A1 20100701 [] (STOEHR TORSTEN [DE], et al);
[US2009221461](#) A1 20090903 [] (VISGER DANIEL C [US], et al)

FI - C10M101/02; C10M145/14; C10M169/04; C10N20/04; C10N30/00&Z; C10N30/02; C10N30/06; C10N40/04; C10N40/25

FT - 4H104/BA02A; 4H104/BA04A; 4H104/BA07A; 4H104/BB33A; 4H104/BB34A; 4H104/CA04A; 4H104/CB08C; 4H104/DA02A; 4H104/EA03C; 4H104/EB05; 4H104/LA20; 4H104/PA02; 4H104/PA03; 4H104/PA41

PA - (A)
JX NIPPON OIL & ENERGY CORP

TI - (A)
POLY(METH)ACRYLATE-BASED VISCOSITY INDEX IMPROVER, AND **LUBRICATING OIL** ADDITIVE AND **LUBRICATING OIL** COMPOSITION CONTAINING VISCOSITY INDEX IMPROVER

AB - (A)
PROBLEM TO BE SOLVED: To provide a viscosity index improver which can impart a sufficient **friction** loss **reducing** effect to a **lubricating oil**, can maintain low temperature fluidity and is excellent in shear stability and to provide a **lubricating oil** additive and a **lubricating oil** composition containing the viscosity index improver.SOLUTION: There is provided a poly(meth)acrylate-based viscosity index improver which has a core and three or more arms which are composed of a **polymer** chain containing a structural unit represented by the following general formula (1) and a specific structural unit and in which one end of the **polymer** chain is bonded to the core, where the Mw is less than 100000 and the **ratio** Mw/Mn is 1.6 or less.

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PN - [JP2015013959](#) A 20150122

PNFP - JP6043245B B2 20161214

PR - JP20130142017 20130705

AP - JP20130142017 20130705

DT - I

CT - || STSE (A)
[JP2009074068](#) A 20090409 [] (SANYO CHEMICAL IND LTD);
[WO2012076676](#) A1 20120614 [] (EVONIK ROHMAX ADDITIVES GMBH [DE], et al);
[JP2004513997](#) A 20040513 [];
[US2012245068](#) A1 20120927 [] (SCANLON EUGENE [US], et al);
[JPH11286520](#) A 19991019 [] (ETHYL CORP);
[JP2007512413](#) A 20070517 [];
[JP2006131854](#) A 20060525 [] (SANYO CHEMICAL IND LTD);
[JP2009007562](#) A 20090115 [] (SANYO CHEMICAL IND LTD);
[JP2009173921](#) A 20090806 [] (SANYO CHEMICAL IND LTD);
[JP2011127029](#) A 20110630 [] (SANYO CHEMICAL IND LTD);
[JP2009256665](#) A 20091105 [] (SANYO CHEMICAL IND LTD);
[JPH1077494](#) A 19980324 [] (ROHM & HAAS);
[JPH0762372](#) A 19950307 [] (ROHM & HAAS);
[JP2005023147](#) A 20050127 [] (SANYO CHEMICAL IND LTD);
[JPS54149704](#) A 19791124 [] (JAPAN SYNTHETIC RUBBER CO LTD);
[JPS5470305](#) A 19790606 [] (SHELL INT RESEARCH)

FI - C10M101/02; C10M145/14; C10N20/02; C10N20/04; C10N30/02; C10N30/06;
C10N40/04; C10N40/25

FT - 4H104/BA02A; 4H104/BA04A; 4H104/BA07A; 4H104/BB33A; 4H104/BB34A;
4H104/CB08C; 4H104/DA02A; 4H104/EA03C; 4H104/EB05; 4H104/LA01; 4H104/LA03;
4H104/PA02; 4H104/PA03; 4H104/PA41

PA - (A)
JX NIPPON OIL & ENERGY CORP

TI - (A)
POLY(METH)ACRYLATE-BASED VISCOSITY INDEX IMPROVER, AND **LUBRICATING OIL**
ADDITIVE AND **LUBRICATING OIL** COMPOSITION CONTAINING VISCOSITY INDEX IMPROVER

AB - (A)
PROBLEM TO BE SOLVED: To provide a viscosity index improver capable of imparting a
sufficient **friction** loss **reducing** effect to a **lubricating oil** and maintaining low
temperature fluidity and to provide a **lubricating oil** additive and a **lubricating oil**
composition containing the viscosity index improver.SOLUTION: There is provided a poly
(meth)acrylate-based viscosity index improver having a **polymer** chain containing a
structural unit represented by the formula (1) and a specific structural unit, where the
Mw of the poly(meth)acrylate-based viscosity index improver is less than 100000 and
the **ratio** (Mw/Mn) is 1.6 or less.

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PN - [JP2015013958](#) A 20150122

PNFP - JP6018981B B2 20161102

PR - JP20130142014 20130705

AP - JP20130142014 20130705

DT - I

CT - || STSE (A)
[JP2009534518](#) A 20090924 []

FI - C10M145/14; C10M169/04; C10N20/02; C10N20/04; C10N30/02; C10N40/04

FT - 4H104/CB08C; 4H104/EA03C; 4H104/EB05; 4H104/LA03; 4H104/PA03

PA - (A)
JX NIPPON OIL & ENERGY CORP

TI - (A)
POLY(METH)ACRYLATE-BASED VISCOSITY INDEX IMPROVER, AND LUBRICATING OIL ADDITIVE AND LUBRICATING OIL COMPOSITION CONTAINING VISCOSITY INDEX IMPROVER

AB - (A)
PROBLEM TO BE SOLVED: To provide a viscosity index improver capable of imparting a sufficient **friction** loss **reducing** effect to a **lubricating oil** and to provide a **lubricating oil** additive and a **lubricating oil** composition containing the viscosity index improver.
SOLUTION: There is provided a poly(meth)acrylate-based viscosity index improver having a **polymer** chain containing a structural unit represented by the following general formula (1), where the **weight** average molecular **weight** (Mw) of the poly(meth)acrylate-based viscosity index improver is less than 100000 and the **ratio** (Mw/Mn) between the **weight** average molecular **weight** (Mw) and the number average molecular **weight** (Mn) is 1.6 or less. [where, R represents a hydrogen atom or a methyl group; and R represents an alkyl group having 1 to 36 carbon atoms.]

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PN - [RU2013108705](#) A 20140910

PNFP - RU2584160 C2 20160520

PR - DE20101038615
20100729; WO2011EP60670
20110627

AP - RU20130108705 20110627

DT - I

CCI - [C08F120/18](#) ; [C10M149/00](#) ;
[C10M149/04](#) ; [C10M149/06](#) ;
[C10M149/10](#)

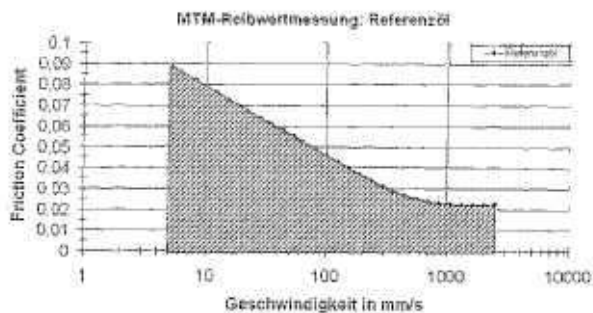
CUI - [C08F261/00](#) ; [C10M149/02](#)

CLC - [C10M2203/1025](#) ,
[C10N2220/022](#) , ADD
- [C10M2209/084](#) , [C10N2260/09](#) ,
ADD

CCA - [C10M2203/1025](#) ;
[C10M2209/084](#) ; [C10M2215/28](#) ;
[C10M2217/023](#) ;
[C10M2217/024](#) ;
[C10M2217/028](#) ; [C10M2217/06](#) ;
[C10N2230/02](#) ; [C10N2230/04](#) ;
[C10N2230/06](#) ; [C10N2230/14](#)

PA - (C2)
EVONIK OIL ADDITIVES GMBH [DE]

TI - (C2)
POLYALKYL(METH)ACRYLATE FOR



IMPROVING
PROPERTIES LUBRICATING OIL

AB

- (C2)

FIELD: chemistry. SUBSTANCE:
present invention relates to
polyalkyl (meth) **acrylate** for
improving the properties
of **lubricating** oils. Describes a
polyalkyl (meth) **acrylate** for
improving the properties
of **lubricating** oils containing
repeating units derived from
(meth) **acrylates** with 6-22
carbon atoms in the alcohol
radical, characterized in that the
polyalkyl (meth) **acrylate**, a graft
copolymer, wherein the graft
base comprises repeating units
derived from (meth) **acrylates**,
comprising: a) from 0 to 40 wt.%
of the repeating units are derived
from (meth) **acrylates** of formula
(I): wherein R is hydrogen or
methyl, a R₁ means an alkyl
radical having 1-5 carbon
atoms, b) from 20 to 99.9 wt.% of
the repeating units are derived
from (meth) **acrylates** of formula
(II): wherein R is hydrogen or
methyl, a R₁ means an alkyl
radical having 6-22 carbon
atoms, c) from 0 to 20 wt.% of the
repeating units are derived from
(meth) **acrylates** of formula (III):
wherein R is hydrogen or methyl,
a R_n alkyl radical of 23-4,000,
and a graft component
comprises from 0.1 to 10 wt.% of
the repeating units are **amine**
derivatives of the polar
ethylenically unsaturated
monomer which is maleic acid
or maleic anhydride and **amine**
is an N-phenyl-1,4 -
phenylenediamine. Also disclosed
is a method for producing the
above polyalkyl (meth) **acrylate**
to form the basis for the above
graft polymerizing

(meth) **acrylate**, which then is grafted polar ethylenically unsaturated monomers, and **polymer** modified N-phenyl-1,4-phenylene **polymer**-analogous reaction. Discloses a **lubricant** composition comprising the above polyalkyl (meth) **acrylate**, and the use of the above described polyalkyl (meth) **acrylate** to **reduce friction**.
 EFFECT: technical result - getting supplements with high viscosity index and improved **friction lubricant**, **reducing** the formation of gray staining or pitting.9 cl, 1 dwg, 6 tbl, 13 ex

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PN - [CN101735366](#) A 20100616

PNFP - CN101735366B B 20110914

PR - CN20091263203 20091217

AP - CN20091263203 20091217

DT - I

PA - (A)

XUZHOU JINQIAO PETROCHEMICAL T; CHINA PETROLEUM & CHEMICAL

- (B)

CHINA PETROLEUM & CHEMICAL; XUZHOU JINQIAO PETROCHEMICAL PIPELINE CONVEYING TECHNOLOGY CO LTD

TI - (A B)

Complex electron donor for **drag reducer** polymerization

AB - (A)

The invention relates to an organic **polymer** synthesis technique, in particular to a complex electron donor for **drag reducer** polymerization, belonging to the technical field of chemical industry. The complex electron donor is characterized in that polymerization monomers are added into an anhydrous oxygen-free reaction system, wherein the mixture **ratio** of laurylene to **styrene** is 10:1-1:10, or the mixture **ratio** of laurylene to octylene is 10:1-1:10; the cocatalyst is 0.1%-3% and is obtained by diluting triisobutylaluminum with a refined **solvent**, wherein the triisobutylaluminum is 20%, the normal heptane is 20%-50%, the rubber **solvent oil** is 20%-50%, the main catalyst is 0.005%-0.1%, and the complex electron donor is 0.01%-0.5%; and the reaction temperature of the system is -40-10 DEG C, the stirring process is carried out continuously, the reaction time is 24-188 hours, thus a sticky super high molecular **weight polymer** is obtained. The invention has the advantages of obviously improving the activity of the catalyst system, **reducing** the consumption of the main catalyst, **reducing** the consumption of other additives, and the like. In the process of production, the heat release of the catalysis system is uniform, and the process control

is stable. By applying the complex electron donor of the invention to long-distance **oil** transmission pipelines, the pipeline transmission capacity is improved.

- (B)

The invention relates to an organic **polymer** synthesis technique, in particular to a complex electron donor for **drag reducer** polymerization, belonging to the technical field of chemical industry. The complex electron donor is characterized in that polymerization monomers are added into an anhydrous oxygen-free reaction system, wherein the mixture **ratio** of laurylene to **styrene** is 10:1-1:10, or the mixture **ratio** of laurylene to octylene is 10:1-1:10; the cocatalyst is 0.1%-3% and is obtained by diluting triisobutylaluminum with a refined **solvent**, wherein the triisobutylaluminum is 20%, the normal heptane is 20%-50%, the rubber **solvent oil** is 20%-50%, the main catalyst is 0.005%-0.1%, and the complex electron donor is 0.01%-0.5%; and the reaction temperature of the system is -40-10 DEG C, the stirring process is carried out continuously, the reaction time is 24-188 hours, thus a sticky super high molecular **weight polymer** is obtained. The invention has the advantages of obviously improving the activity of the catalyst system, **reducing** the consumption of the main catalyst, **reducing** the consumption of other additives, and the like. In the process of production, the heat release of the catalysis system is uniform, and the process control is stable. By applying the complex electron donor of the invention to long-distance **oil** transmission pipelines, the pipeline transmission capacity is improved.

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PN - [US4236545](#) A 19801202

PR - US19770866073 19771230

AP - US19770866073 19771230

DT - *; Rep

CT - || STSE (A)

[US3472769](#) A 19691014 [] (PAN AMERICAN PETROLEUM CORP);

[US3681215](#) A 19720801 [] (DU PONT)

CCI - [C09K3/00](#) ; [F17D1/17](#)

CCA - [Y10T137/0391](#)

PA - HERCULES INC

TI - Use of radiation-induced polymers as **friction reducing** agents

AB - **Drag reduction** of fluids containing a water phase, e.g. **hydrocarbon**-in-water mixture, flowing through a conduit, is **reduced** by incorporating within the water phase a **polymer** obtained by radiation-induced polymerization of acrylamide, methacrylamide, acrylic acid, methacrylic acid, alkali metal salts thereof, or mixtures thereof. The polymerization is preferably carried out in 10-60% aqueous monomer solution with gamma radiation. The mixture of monomers, before radiation, preferably contains 25-99% acrylamide and 75-1% sodium **acrylate**. The **polymer** preferably shows viscoelastic effects at high concentrations in a **solvent**. Concentrations of about 1-10,000 **ppm** of the **polymer** in the water phase is desired. Examples of fluids useful with this invention include **hydrocarbon**-in-water and water-in-**hydrocarbon** slurries, the **hydrocarbon** is preferably comminuted **oil** shale or coal, congealed particles of crude **oil** and/or wax, viscous crude **oil**, etc.

9/20 © EPODOC / EPO

- PN - [US5080121](#) A 19920114
- PR - US19900563447 19900806
- AP - US19900563447 19900806
- DT - *; Rep
- CT - || STSE (A)
[EP0077164](#) A1 19830420 [] (LUNDBERG ROBERT DEAN, et al);
[DE2420212](#) A1 19750918 [] (BRUNOLD MARCEL DR [CH], et al);
[JPS60202109](#) A 19851012 [] (BAN KAORU, et al)
- CCI - [C08F220/18](#) ; [C09K3/00](#)
- CCA - [Y10T137/0391](#)
- PA - COUNCIL SCIENT IND RES [IN]
- TI - Process for the preparation of a new **polymer** useful for **drag reduction** in **hydrocarbon** fluids in exceptionally dilute **polymer** solutions
- AB - Novel **polymer** for **drag reduction** in **hydrocarbon** fluids is disclosed which comprises polymerising a C-12 to C-18 **acrylate** or methacrylate monomer and an ionic with or without other monomers acting as fillers or additives at a temperature between 20 DEG and 30 DEG C. with constant stirring and separating the resultant **polymer**. The preparation of the polymers is simple, shear stability is good even at high shear rates, insensitivity to the presence of any other polar **solvent** and good solubility in almost all the **hydrocarbon** liquids. The novel **polymer reduces friction** in the flow of a **hydrocarbon fluid** by a factor around 5 at concentrations as low as 1 to 25 **ppm**.

10/20 © EPODOC / EPO

- PN - [JP2005171101](#) A 20050630
- PR - JP20030413830 20031211
- AP - JP20030413830 20031211
- DT - I
- FI - C09K7/00&B; C09K7/02&B; C09K8/02; C09K8/04; E21D9/06&301M
- FT - 2D054/AC01; 2D054/AC04; 2D054/AC05; 2D054/BA02; 2D054/CA01; 2D054/DA12; 2D054/DA33; 2D054/DA35; 2D054/FA03; 2D054/FA12
- PA - NIPPON CATALYTIC CHEM IND
- TI - MUD-ADDING AGENT, SHIELD METHOD AND PIPE-JACKING METHOD USING THE SAME AGENT
- AB - PROBLEM TO BE SOLVED: To provide a mud-adding agent whose characteristics are as follow: (1) excellent in salt resistance and sea water resistance; in shield and pipe-jacking methods, (2) capable of giving plastic fluidity through improvement of a particle size distribution of excavation earth and sand; (3) capable of imparting a water-stopping property to the excavation earth and sand; (4) capable of exhibiting **lubricity** to lower torque of a working face etc.; (5) capable of imparting **lubricity** to the excavation earth and sand, lowering the **friction** of an inside of a slurry discharge pipe; and (6) capable of performing **lubricity** whereby propulsion resistance generated at jacking a cast-iron pipe, is **reduced**.
- SOLUTION: The mud-adding agent contains a water-soluble **polymer** (P) having ≥ 500 ,

000 **weight** average molecular **weight**, obtained by polymerizing a monomer component comprising 20-99 mol% of (A) a (meth)acrylic acid (salt) monomer, and 1-80 mol% of (B) a (meth)**acrylate**-based monomer expressed by formula (1): $\text{CH} \langle \text{SB} \rangle_2 \langle \text{SB} \rangle = \text{C} (\text{R} \langle \text{SP} \rangle_1 \langle \text{SP} \rangle) - \text{COOZ} \langle \text{SP} \rangle_1 \langle \text{SP} \rangle (\text{O}) \langle \text{SB} \rangle_p \langle \text{SB} \rangle \text{Z} \langle \text{SP} \rangle_2 \langle \text{SP} \rangle \text{OX}$ (in the formula $\text{R} \langle \text{SP} \rangle_1 \langle \text{SP} \rangle$ is a hydrogen atom or a methyl group; $\text{Z} \langle \text{SP} \rangle_1 \langle \text{SP} \rangle$ and $\text{Z} \langle \text{SP} \rangle_2 \langle \text{SP} \rangle$ are each a $\leq 8\text{C}$ alkylene group; X is a $\leq 4\text{C}$ **hydrocarbon** group; and p is an integer of 0 or 1).

- COPYRIGHT: (C)2005,JPO&NCIPI

11/20 © EPODOC / EPO

PN - [JPH08157855](#) A 19960618

PNFP - JP2906024B B2 19990614

PR - JP19940330607 19941206

AP - JP19940330607 19941206

DT - I

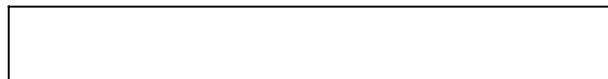
FI - C10M139/00&Z; C10M145/14;
C10M169/04; C10N10/12;
C10N30/06; C10N40/04;
C10N40/25

FT - 4H104/BG10C; 4H104/BH07C;
4H104/CB08C; 4H104/DA02A;
4H104/EB02; 4H104/EB05;
4H104/FA06; 4H104/LA03;
4H104/PA02; 4H104/PA03;
4H104/PA05; 4H104/PA41;
4H104/PA42; 4H104/PA44

PA - (A)
SANYO CHEMICAL IND LTD

TI - (A)
LUBRICATING OIL

AB - (A)
PURPOSE: To prepare the
subject **lubricating oil** for
passenger car, containing a
viscosity index improver
consisting of plural specific
polymers, effective for
maximizing the effect of a
molybdenum-based **friction** and
abrasion preventing agent,
exhibiting low **friction** coefficient
even after oxidative
deterioration of the **lubricating**
oil and useful for **reducing** the
fuel consumption.
CONSTITUTION: This **lubricating**



oil contains (A) 0.3-30wt.% of a viscosity index improver composed of a **polymer** containing (i) 20-70wt.% of an alkyl **acrylate** and (ii) 80-30wt.% of an alkyl methacrylate as constituent units, (B) 0.05-5wt.% of a molybdenum-based **friction** and abrasion preventing agent and (C) 99.65-65wt.% of a **lubricating** base oil. Preferably, the component (i) is an alkyl **acrylate** having an 8C alkyl group or its combination with an alkyl **acrylate** containing a 1-4C alkyl group, the component C contains an **oil** containing an isomerized paraffin and having high viscosity index as an essential component and the **lubricating oil** further contains (D) a pour point depressant at a **weight ratio** (A: D) of 80:20 to 99:1.

12/20 © EPODOC / EPO

PN - [JPH07300596](#) A 19951114

PNFP - JP2748104B B2 19980506

PR - JP19940289007 19941027; JP19940065583 19940308

AP - JP19940289007 19941027

DT - I

CCI - [C10M145/14](#)

CCA - [F02B1/04](#) ; [C10M2209/084](#)

FI - C10M109/00; C10M145/14; C10M145/14; C10M169/04

FT - 4H104/BB32C; 4H104/CB08C; 4H104/CJ17C; 4H104/DA02A; 4H104/EB02; 4H104/EB05; 4H104/EB08; 4H104/EB20; 4H104/FA06; 4H104/LA01; 4H104/LA03; 4H104/LA05; 4H104/PA02; 4H104/PA03; 4H104/PA05; 4H104/PA41; 4H104/PA42; 4H104/PA44

IDT - M10N23002; M10N23006; M10N24004; M10N240042; M10N240044; M10N240045; M10N240046; M10N24008; M10N24010; M10N240101; M10N240102; M10N240103; M10N240104

PA - (A)
SANYO CHEMICAL IND LTD

TI - (A)
VISCOSITY INDEX IMPROVER AND **LUBRICATING OIL**

AB - (A)
PURPOSE: To obtain a viscosity index improver excellent in the ability to improve

viscosity index, low-temperature viscosity characteristics, fuel-saving properties, oxidation resistance and an effect of **reducing friction** and abrasion by using a **polymer** comprising a specified alkyl (meth)**acrylate** monomer. CONSTITUTION: This improver comprises a **polymer** comprising at least 70wt.% alkyl (meth)**acrylate** with 10C or lower alkyl. The above alkyl (meth)**acrylate** used is desirably an alkyl **acrylate** with 1-4C alkyl, an alkyl (meth)**acrylate** with 5-10C alkyl or a combination thereof with alkyl (meth)**acrylate** with 1-4C alkyl. It is more desirably a mixture of alkyl **acrylates** with 1-4C alkyl and with 8C alkyl more particularly such a mixture in a 1-4C alkyl **acrylate**/8C alkyl **acrylate weight ratio** of 0:100 to 30:70.

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PN - [JPS63113002](#) A 19880518

PNFP - JPH0686483B B2 19941102

PR - JP19860258542 19861031

AP - JP19860258542 19861031

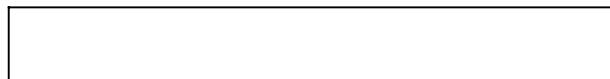
DT - I

FI - C08F10/00&510; C08F10/06;
C08F4/60; C08F4/639; C08F4/68;
C08F4/68+MFG; C08F8/00;
C08F8/00+MJA

FT - 4J017/AA04; 4J017/AB14;
4J017/AB20; 4J017/AC05;
4J100/AA03P; 4J100/BC43H;
4J100/CA01; 4J100/CA27;
4J100/CA31; 4J100/DA01;
4J100/FA09; 4J100/HA35;
4J100/HA61; 4J100/HB25;
4J100/HB52; 4J100/HC01;
4J100/HC09; 4J128/AA01;
4J128/AB00; 4J128/AC32;
4J128/AC38; 4J128/BA00A;
4J128/BA01B; 4J128/BB00A;
4J128/BB01B; 4J128/BC01B;
4J128/BC03B; 4J128/BC04B;
4J128/BC08B; 4J128/BC09B;
4J128/BC14B; 4J128/BC16B;
4J128/EA02; 4J128/EB02;
4J128/EB04; 4J128/EB05;
4J128/EB09; 4J128/EB10;
4J128/EC01; 4J128/EC02;
4J128/ED06; 4J128/EF01;
4J128/FA02; 4J128/GA01;
4J128/GA06; 4J128/GA26;
4J128/GB07

PA - (A)
TOA NENRYO KOGYO KK

TI - (A)



END-MODIFIED
PROPYLENE **POLYMER** AND
PRODUCTION THEREOF

AB

- (A)

PURPOSE: To obtain a novel **polymer** having extremely narrow molecular **weight** distribution, containing phenyl groups at approximately all chain ends, by polymerizing propylene in the presence of a specific polymerization catalyst, reacting the reaction product with a styrenic compound and successively a proton donor.

CONSTITUTION: Propylene is polymerized in the presence of a polymerization catalyst consisting of a catalytic component containing a vanadium compound shown by formula I (R_{6-8} are 1-8C **hydrocarbon** and an organometallic compound (e.g. dimethylaluminum chloride, etc.) or metal of group I-III of the periodic table, the prepared living propylene **polymer** is reacted with a styrenic compound (e.g. **styrene**, tetramethyl-**styrene**, etc.) shown by formula II (R_{1-5} are H or 1-8C **hydrocarbon**) and then with a proton donor (e.g. methanol, hydrochloric acid, etc.) to give the aimed **polymer** shown by formula III (n is 20-10,000). The **polymer** is usable as a compatible **solvent** for polymers, surface modifier for substances, viscosity index improver, **drag reducing** agent, etc.

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PN - [JPH0233380](#) A 19900202

PNFP - JPH0340150B B2 19910618

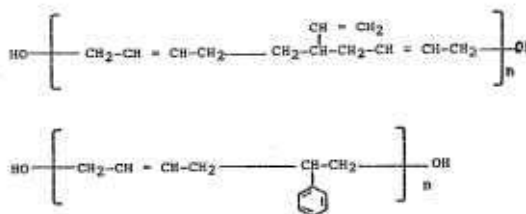
PR - JP19890002523 19890109; JP19880093693 19880415

AP - JP19890002523 19890109

DT	- I
FI	- D01F11/08; D06M15/21&Z; D06M15/233; D06M15/263; D06M15/285
FT	- 4L033/AB03; 4L033/AC09; 4L033/AC15; 4L033/CA13; 4L033/CA18; 4L033/CA23; 4L038/AA15; 4L038/AB08; 4L038/BA13; 4L038/BA15; 4L038/BA22; 4L038/BA35; 4L038/BA41; 4L038/BB06; 4L038/BB07; 4L038/BB09; 4L038/CA01; 4L038/DA20
PA	- (A) SANYO CHEMICAL IND LTD
TI	- (A) STRAIGHT-TYPE LUBRICANT FOR FILAMENT YARN
AB	- (A) PURPOSE:To provide the title lubricant little in scattering and friction during high-speed fiber-forming processes, containing a polymer from essential monomer(s) selected from carboxylic alkyl ester group-contg. monomers and carboxyl group-contg. monomers, etc. CONSTITUTION:A (co) polymer (20000-100000 in molecular weight) from essential monomer(s) selected from carboxylic alkyl ester group-contg. monomers (>=5C alkyl group), carboxyl group-contg. monomers, amide group-contg. monomers (e. g., N-vinyl pyrrolidone) and aromatic hydrocarbon monomers (e.g., styrene), or a copolymer from said carboxylic alkyl ester group-contg. monomer and another carboxylic alkyl ester group-contg. monomer (<=4C alkyl group) is incorporated with a base oil containing a smoothing agent such as mineral oil or vegetable oil , thus obtaining the objective straight-type lubricant . 0.2-5%owf of this lubricant is oiled during such processes as fiber-forming or false-twisting, thereby in particular in high-speed processes, suppressing the scattering the lubricant and reducing the friction between fiber and metallic members leading to high productivity.

15/20 © EPODOC / EPO

PN	- GB2127431 A 19840411
PNFP	- GB2127431 B 19851120
PR	- US19820428374 19820929
AP	- GB19830025904 19830928
DT	- *; Rep
CT	- STSE (A) GB1568951 A 19800611 [] (SHELL INT RESEARCH)
CCI	- C10M143/10 ; C10M143/12 ; C10M129/90
CLC	- C10M2205/06 , C10M2205/06 % 2, ADD
CCA	- C10M2205/04 ; C10M2205/06
PA	- (A B) EXXON RESEARCH ENGINEERING CO
TI	- (A) Lubricating oil composition - (B)



LUBRICATING OIL COMPOSITION

AB

- (A)
A **lubricating oil** composition having improved **friction reducing** properties comprises a major amount of **weight** of **lubricating base oil** and from 0.01 to 5.0% by **weight** of at least one **oil-soluble hydroxyl terminated polymer** of butadiene and/or **styrene**-butadiene. Preferably the number average molecular **weight** of the **polymer** (s) is from 100 to 10,000, more especially 1,000 to 6,000. Preferred polymers are those having the structures <IMAGE> where n is from 2 to 100.0

16/20 © EPODOC / EPO

- PN - [GB1089525](#) A 19671101
- PR - JP19630056803 19631023; JP19640051692 19640910; JP19630070285 19631225
- AP - GB19640042900 19641021
- DT - **
- CCI - [C08K5/0091](#) ; [C08L23/10](#)
- CLC - [C08K5/0091](#) , [C08L23/02](#) , INV
- [C08L23/10](#) , [C08L2666/02](#) , INV
- [C08L23/10](#) , [C08L91/06](#) , INV
- [C08L23/10](#) , [C08L2666/06](#) , INV
- CCA - [C08L23/06](#) ; [C08L23/0861](#) ; [C08L39/08](#) ; [C08L91/06](#) ; [C08L2203/12](#) ; [C08L2205/02](#) ; [C08L2205/03](#) ; [C08L2205/035](#)
- PA - MITSUBISHI RAYON CO
- TI - Modified polypropylene fibers and method for preparing the same
- AB - Polypropylene fibres having good abrasion resistance comprise polypropylene and 1 to 20 **weight** per cent based on the polypropylene of an abrasion resistant agent comprising (A) a paraffin **hydrocarbon** of molecular **weight** 500 to 3000 and having 6 or less methyl groups per 100 carbon atoms and (B) 5 to 20 **weight** per cent based on (A) of polyethylene. The paraffin **hydrocarbon** may be obtained from natural sources, or by the polymerization of petroleum refinery hydrocarbons. The fibres may also comprise dyeability modifiers, e.g. copolymers of alkenyl pyridines with alkenyl aromatic compounds, metal salts or anion exchange substances, polyesters, polyamides, polystyrene, polyvinyl pyridine, polyacrylic esters and esters and amides of higher fatty-acids, optionally together with dyeing assistants, e.g. condensates of alkylene oxides with alcohols, phenols, glycols, **glycol** semi-esters and alkylamines; polyethylene glycols; polypropylene glycols; and random and block ethylene oxide/propylene oxide copolymers. To **reduce** slip the fibres may be heat treated under tension after

immersing in a solution or dispersion of polyvinyl chloride, polyvinylidene chloride, polyvinyl acetate, polyvinyl alcohol, polyvinyl acetal, polymethyl methacrylate, polystyrene, polyurethane, polyester, polyethylene, polypropylene, alkyd resin, urea resin, melamine resin, phenolic resin, xylene resin, silicone resin, epoxy resin, petroleum resin, coumarone resin, petroleum resin, rosin, turpentine resin or natural or synthetic rubber. Many suitable materials are listed, and many examples are given of fibres made of polypropylene, paraffin **hydrocarbon** and polyethylene, optionally with dyeability modifiers and dyeing assistants, and optionally impregnated to **reduce** slip. The products are suitable for making wearing apparel and fishing nets, ropes and the like. ALSO: The dye receptivity of fibres made of compositions comprising polypropylene and 1 to 20 **weight** per cent based on the polypropylene of an abrasion resistant agent consisting essentially of (A) a paraffin **hydrocarbon** of molecular **weight** 500 to 3000 and having 6 or less methyl groups per 100 carbon atoms and (B) 5 to 20 **weight** per cent based on (A) of polyethylene, may be improved by incorporating therein a dyeability modifier which is a **polymer** of a polymerisable pyridine derivative or a metal compound, and/or a dyeing assistant selected from polyoxyethylene alkyl ethers, polyoxyethylene phenyl ethers, polyoxyethylene **glycol** esters of aliphatic and aromatic acids, polyoxyethylene alkylamines, polyoxyalkylene glycols, polyoxypropylene **glycol** esters of aliphatic and aromatic acids, polyoxypropylene alkyl ethers, polyoxypropylene phenyl ethers, random ethylene oxide (propylene oxide copolymers, polyethylene **glycol** and polypropylene **glycol**. The modifier may be a **styrene** /vinyl pyridine copolymer or a carboxylate or phenate of calcium, barium, magnesium, zinc, cadmium, aluminium, tin, lead, titanium, chromium, cobalt or nickel, many suitable compounds being specified. Examples describe the dyeing of abrasion resistant polypropylene fibres containing (4) a **styrene** /2-methyl-5-vinylpyridine copolymer with acid dyes and containing (5) nickel stearate or a water or laurylamine complex of nickel salts of bis(2-hydroxy-5-tert. octylphenyl) sulphone. **Reduction** of slip in polypropylene fibres made of abrasion resistant compositions as defined above may be effected by impregnating the fibres with a solution or dispersion of a resin or elastomer, optionally together with **friction** increasing, antistatic, starching and finishing agents, surfactants and **softeners**, and heating the impregnated fibres under tension. Specified impregnants are polyvinyl chloride, polyvinylidene chloride, polyvinyl acetate, polyvinyl alcohol, polyvinyl acetal, polyacrylates, polymethacrylates, polyesters, polyurethanes, polystyrene, polyethylene, polypropylene, cellulose derivatives; urea, phenolic, melamine, xylene, silicone and epoxy resins; butadiene, isoprene, polysulphide, silicone, fluorocarbon, urethane, chlorosulphonated polyethylene, olefin copolymer, vinyl and natural rubbers; and rosin, shellac and coumarone and petroleum resins. The preferred impregnants for **reducing** slip in fibres for (1) fishing nets are coumarone resin, rosin and neoprene rubber; (2) ropes are coumarone, acrylic, melamine and vinyl acetate resins, rosin and neoprene and vinyl rubbers, preferably with epoxy, phenolic or alkyd resin for dielectric heating; and (3) fabrics are coumarone, vinyl acetate, acetal and polyolefin resins, rosin and natural and neoprene rubbers. In examples fibres for fishing net yarns are impregnated with (7) an emulsion prepared by dispersing a xylene solution of a coumarone resin in water containing oleic acid/monoethanolamine and anhydrous silicic acid as **friction** increasing agent; and yarns for making ropes are impregnated with (8) an aqueous emulsion of polyvinyl acetate containing glycerine.

PN	- GB599157 A 19480305
AP	- GB19450017454 19450709
DT	- *
CCI	- B25B27/28
CCA	- F04C2210/26
PA	- GILBERT HOLM SWART
TI	- Resilient joints or mountings and method of making same
AB	- In the assembly of a resilient mounting (see Group XXXII) of the kind comprising inner and outer rigid tubular members separated by a separately vulcanized annulus of rubber like material under radial compression and longitudinal extension, the engaging surfaces of the rigid element and annulus are treated to reduce friction and then after assembly to cause adhesion without removing strain in the annulus. Friction is reduced by any suitable hardening treatment of the rubber such as by immersion into sulphur chloride, anhydrous hydrochloric acid, a solution of sulphuric acid, a solution of a halogen such as chlorine, as described in U.S.A. Specification 1,928,988, a solution of an oxidising agent or by a coating of a hard drying composition such as a solution or dispersion of a thermoplastic or thermosetting resin. A suitable lubricant may also be used, but should be completely absorbed in the rubber annulus. If the annulus is composed of a natural rubber compound or of a copolymer of butadiene and styrene rubber compound, petrolatum or mineral oil may be used as lubricant . For copolymers of butadiene acrylonitrile types of rubber compounds suitable plasticizers such as oleic acid or other higher fatty acids may be used. Other generally suitable lubricants include high boiling esters or oily plasticizers rubber cements, solutions of rubbery polymer &c. Treatment for adhesion comprises the application of a resinous film to the engaging surfaces of the rubber annulus and rigid elements and may comprise as a basic constituent one or more natural or synthetic resins such as the hard setting organo-silicones, thermoplastic and thermosetting resins including vinyl esters such as polyvinyl chloride, copolymer of vinyl chloride and vinyl acetate, the polyacrylate resins including polymethyl methacrylate, and esters and amides of acrylic and chloracrylic acids, rubber addition products such as rubber chloride, polyvinyl acetal resins including polyvinyl butyral, phenol aldehyde and modified aldehyde resins including polyvinyl butyral, modified phenol formaldehyde resins, rubber modified phenolic resins, the condensation products such as the polyhydric alcohol esters of unsaturated esters of unsaturated acids and copolymers of these materials with esters of polybasic saturated or unsaturated acids with unsaturated alcohols such as diallyl maleate &c. The resin may be an organic rubber to metal adhesive which may include cyclized rubber derivatives of rubber conversion products such as the reaction products of rubber and amphoteric metal halides, isomerization products of rubber prepared by heating rubber in the presence of sulphuric or organic sulphonic acids, such as phenol sulfonic acids, including paratoluene sulphonic acid and various salts of strong acids, modified rubber hydrochloride, rubber chloride &c. Preferred rubber to metal adhesives are those described in Specification 595,009 and prepared by heating a mixture of rubber and a salt of a strong acid and a salt of a weak acid in a form having thin section to obtain an exothermic reaction product. After assembly of the mounting the engaging surfaces are subjected to heat by the passage of an electric current, high frequency electric field, of magnetic flux. Specification 461,478 also is referred to.

18/20 © EPODOC / EPO

- PN - [EP0471116](#) A1 19920219
- PNFP - EP0471116 B1 19960306
- PR - US19900563447 19900806
- AP - EP19900308868 19900813
- DT - **
- CT - || STSE (A1)
[US4983186](#) A 19910108 [E] (NAIMAN MICHAEL I [US], et al);
[US3758406](#) A 19730911 [X] (MALONE W, et al);
[US4508128](#) A 19850402 [YD] (KOWALIK RALPH M [US], et al)
- CCI - [C08F220/18](#) ; [C09K3/00](#)
- CCA - [Y10T137/0391](#)
- PA - (A1 B1)
COUNCIL SCIENT IND RES [IN]
- TI - (A1)
A novel **polymer** useful for **drag reduction** in **hydrocarbon** fluids and its preparations.
- (B1)
A **polymer** useful for **drag reduction** in **hydrocarbon** fluids and its preparations
- AB - (A1)
Novel **polymer** for **drag reduction** in **hydrocarbon** fluids is disclosed which comprises polymerising a C-12 to C-18 **acrylate** or methacrylate monomer and an ionic with or without other monomers acting as fillers or additives at a temperature between 20 and 30°C with constant stirring and separating the resultant **polymer**. The preparation of the polymers is simple, shear stability is good even at high shear rates, insensitivity to the presence of any other polar **solvent** and good solubility in almost all the **hydrocarbon** liquids. The novel **polymer reduces friction** in the flow of a **hydrocarbon fluid** by a factor around 5 at concentrations as low as 1 to 25 ppm.

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- PN - [CA2023298](#) A1 19910823
- PNFP - CA2023298 C 19970429
- PR - IN1990DE16019 19900222
- AP - CA19902023298 19900815
- DT - I
- PA - (A1 C)
COUNCIL SCIENT IND RES [IN]
- TI - (A1 C)
PROCESS FOR THE PREPARATION OF A NEW **POLYMER** USEFUL FOR **DRAG REDUCTION** IN **HYDROCARBON** FLUIDS IN EXCEPTIONALLY DILUTE **POLYMER** SOLUTIONS
- AB - (C)
Novel **polymer** for **drag reduction** in **hydrocarbon** fluids is disclosed which comprises polymerising a C-12 to C-18 **acrylate** or methacrylate monomer and an ionic with or without other monomers acting as fillers or additives at a temperature between 20 and

30.degree.C with constant stirring and separating the resultant **polymer**. The preparation of the polymers is simple, shear stability is good even at high shear rates, insensitivity to the presence of any other polar **solvent** and good solubility in almost all the **hydrocarbon** liquids. The novel **polymer reduces friction** in the flow of a **hydrocarbon fluid** by a factor around 5 at concentrations as low as 1 to 25 **ppm**.

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PN - [CA1084869](#) A 19800902

PR - US19760739686 19761108

AP - CA19770290380 19771107

DT - I

CCI - [C08F20/56](#) ; [C08F2/54](#) ; [F17D1/16](#)

CCA - [C10L1/1963](#) ; [C10L1/2364](#) ; [C10M2209/084](#) ; [C10M2217/024](#) ; [C10M2217/06](#) ; [C10N2240/22](#) ; [C10N2240/66](#)

PA - HERCULES INC

TI - USE OF RADICATION-INDUCED POLYMERS AS **FRICTION REDUCING AGENTS**

AB - **Drag reduction** of fluids containing a water phase, e.g. **hydrocarbon**-in-water mixture, flowing through a conduit, is **reduced** by incorporating within the water phase a **polymer** obtained by radiation-induced polymerization of acrylamide, methacrylamide, acrylic acid, methacrylic acid, alkali metal salts thereof, or mixtures thereof. The polymerization is preferably carried out in 10-60% aqueous monomer solution with gamma radiation. The mixture of monomers, before radiation, preferably contains 25-99% acrylamide and 75-1% sodium **acrylate**. The **polymer** preferably shows viscoelastic effects at high concentrations in a **solvent**. Concentrations of about 1-10,000 **ppm** of the **polymer** in the water phase is desired. Examples of fluids useful with this invention include **hydrocarbon**-in-water and water-in-**hydrocarbon** slurries, the **hydrocarbon** is preferably comminuted **oil** shale or coal, congealed particles of crude **oil** and/or wax, viscous crude **oil**, etc.