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PN - [CN106749886](#) A 20170531

PR - CN20151823482 20151124

AP - CN20151823482 20151124

DT - I

PA - PETROCHINA CO LTD

TI - Heat/salt thickening **copolymer** and preparation method thereof

AB - The invention provides a heat/salt thickening **copolymer** and a preparation method thereof. The preparation method of the **copolymer** includes the steps of: mixing **acrylamide**, **acrylic acid** (hydrophilic **monomer**), N-alkyl **acrylamide** (**temperature** - sensitive **monomer**), and alkyl styrene (hydrophobic **monomer**) with water, then adding a surfactant and a water **soluble** initiator, carrying out polymerization reaction on the formed system at 30-90DEG C for 0.25-24h, then conducting aftertreatment to obtain the heat/salt thickening **copolymer**. The heat/salt thickening **copolymer** prepared by the method has the characteristics of **temperature** resistance and salt resistance, viscosity increase and thickening phenomena occur to an aqueous solution of the heat/salt thickening **copolymer** along with the rise of **temperature** and increase of salt content, therefore the heat/salt thickening **copolymer** is suitable for use as a polymer **oil** displacement agent for high **temperature** and high salinity stratum.

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PN - [CN103554360](#) A 20140205

PNFP - CN103554360B B 20140730

PR - CN20131533660 20131031

AP - CN20131533660 20131031

DT - I

CT - || STSE (A)

[CN1405266](#) A 20030326 [A] (UNIV SICHUAN [CN])

[A] 1-2

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[JP2010270170](#) A 20101202 [A] (TOAGOSEI CO LTD)

[A] 1-2

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[US4694046](#) A 19870915 [A] (BOCK JAN [US], et al)

[A] 1-2

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[US4709759](#) A 19871201 [A] (BOCK JAN [US], et al)

[A] 1-2

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[CN103305204](#) A 20130918 [A] (UNIV SOUTHWEST PETROLEUM)

[A] 1-2

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[JPH02163189](#) A 19900622 [A] (DAI ICHI KOGYO SEIYAKU CO LTD)

[A] 1-2

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[CN103059217](#) A 20130424 [A] (UNIV SOUTHWEST PETROLEUM)

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[CN101463116](#) A 20090624 [A] (UNIV CHENGDU TECHNOLOGY [CN])

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全文

PA - (A B)
UNIV SOUTHWEST PETROLEUM

TI - (A B)
Temperature-resistant salt-resistant amphiphilic **copolymer** as well as preparation method thereof

AB - (A)
The invention discloses a **temperature**-resistant salt-resistant amphiphilic **copolymer** as well as a preparation method thereof. The **copolymer** is copolymerized from **acrylamide** and **acrylic acid** serving as a water-**soluble** monomers, N-aryl **acrylamide** serving as a hydrophobic rigid **monomer** and methyl propylene acyloxy ethyl dimethyl alkyl ammonium bromide (chloride) serving as a surface-activity flexible **monomer** by virtue of a water-**soluble** free radical. When a **temperature**-resistant salt-resistant rigid lateral group is introduced on an **acrylamide** molecule main chain, a covalent bond is linked with a flexible molecule chain with good **solubilizing** capacity and tackifying capacity, therefore the **copolymer** disclosed by the invention has excellent shearing resistance, **temperature** resistance and salt resistance as well as long-term heat salt stability and is suitable for crude **oil** extraction of medium-high **temperature** high-salt **oil** fields. The preparation method disclosed by the invention is reliable in principle, simple and convenient to operate, and wide in market prospect.

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PN - [GB770889](#) A 19570327

PR - USX770889 19520110

AP - GB19520032596 19521223

DT - *

CCI - [C09K11/06](#)

PA - AMERICAN CYANAMID CO

TI - Improvements relating to fluorescent pigments

AB - A pigment for forming inks, enamels and coating compositions comprises a solid solution of a water-**soluble** fluorescent organic dyestuff in a thermoplastic resinous substrate consisting of a polymeric product of at least one vinyl type **monomer**, the ratio of dyestuff to substrate being from about 0.2 to about 5 per cent based on the weight of the resin, the pigment imparting a brilliant fluorescence in daylight or in ultra-violet light to a film comprising the pigment and a suitable binder or vehicle. The resinous substrate usually consists of polyacrylonitrile or a **copolymer**, the major portion of which is acrylonitrile. In one example to an aqueous dispersion of polyacrylonitrile containing polymer solids in the wet gel state or water slurried state glacial acetic **acid** was added with stirring to form an emulsion and then a water solution of Rhodamine 6G, Rhodamine B and Uramine B-4315. The mixture was stirred, filtered and washed, and the resulting pigment air-dried and ground and made into an enamel film with a long **oil** alkyd resin and a urea formaldehyde resin. Hydrochloric **acid** can be used instead of acetic **acid** or the **acid** omitted. In other examples the resinous substrate can be a **copolymer** of acrylonitrile containing 10 per cent glycidyl methacrylate, 10 per cent 2-hydroxyethylmethacrylate, 10 per cent dichlorostyrene, 10 per cent maleic anhydride, 5 or 10 per cent **acrylamide** or 5 per cent **acrylic acid**, or can be polyethylene, polychlorotrifluoroethylene, polydimethylstyrene or a **copolymer** of acrylonitrile, vinyl acetate and vinyl pyridine. In the latter case the **copolymer** was pretreated in a rising **temperature** bath prepared by mixing with water solutions of sodium chlorite, " Calgon " (Registered Trade Mark) and sulphated dodecyl alcohol (sodium salt) and adding concentrated nitric **acid**. The polyethylene, polychlorotrifluoroethylene and the polydimethylstyrene can be slurried in a mixture of water and alcohol. The water dispersion of polyacrylonitrile can have added to it the sodium salt of sulphated dodecyl alcohol or polyacrylonitrile powder can be dissolved in dimethyl formamide. In another example, the dye was dissolved in acrylonitrile and the product emulsion polymerized. A water dispersion of a polyamide resin can be added to the polyacrylonitrile-dye complex. Dyes or mixtures of dyes referred to in the Specification include Rhodamine 6G, Rhodamine B, Uramine B-4315, Auramine, Calcomine Brilliant Flavine S, Brilliant Sulfoflavine FS, Calcozine Flavine TG, 4 - methyl - 7 - diethylamino coumarin, Calcocid Blue EG, Calcocid Alizarine Blue SAPG, Calcocid Green G, 4-beta-hydroxyethylamino-1,8-naphthalic N-butylimide (Calcofluor Yellow HEB), Calcocid Malling Green 6B, Calcocid Milling Fast Green CR and Phthalocyanine Green. Specification 712,219 is referred to.

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PN - [GB810206](#) A 19590311

PR - US19540442918 19540712

AP - GB19550020056 19550711

DT - **

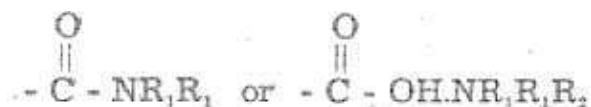
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- CLC - [C08F8/32, C08F220/00](#) , INV
 - [C08F8/32, C08F222/10](#) , INV
 - [C08F8/00, C08F20/12](#) , INV
- CCA - [C10L1/2362](#) ; [C10L1/2364](#) ; [C10L1/2366](#) ; [C10L1/2368](#) ; [C10L1/2468](#) ; [C10L1/2675](#) ;
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[C10N2240/62](#) ; [C10N2250/10](#)
- PA - BATAAFSCHE PETROLEUM
- TI - Hydrocarbon **oil** compositions and additives therefor
- AB - **Oil-soluble** polysubstituted long - chain alkanes, suitable for use as **oil** additives, contain attached to a plurality of the carbon atoms of the alkane chain a plurality of hydrolysis-resistant **oil-solubilizing** radicals, each containing an uninterrupted hydrocarbon group of at least 8 carbon atoms, a plurality of alkoxycarbonyl radicals and a plurality of N-substituted carbamyl or thiocarbamyl radicals wherein at least one of the substituents to the N-atom is a polar organic radical attached to the N-atom by an N-C linkage, the ratio of the average number of alkoxycarbonyl plus N-substituted carbamyl radicals to the number of hydrolysis-resistant **oil-solubilizing** radicals is between 4 to 1 and 1.1 to 1 and at least 10 per cent but not more than 90 per cent of the total alkoxycarbonyl plus N-substituted carbamyl radicals are N-substituted carbamyl radicals. The polysubstituted alkanes, preferably of molecular weight between 2,000 and 150,000, are prepared by copolymerizing (1) an ethylenically unsaturated **monomer** having a single terminal ethylenic group and an uninterrupted chain of at least 10 carbon atoms; (2) an ester of an ethylenically unsaturated carboxylic **acid** and a lower alkanol; and (3) an N-substituted amide of an unsaturated carboxylic **acid** wherein at least one of the substituents to the N-atom is a polar organic radical attached to the N-atom by an N-C linkage. The **monomer** (1) is preferably a normal or branched chain a -olefine containing from 16 to 30 carbon atoms, e.g. n-hexadecene-1, n-octadecene-1, n-tricosene-1, and n-octacosene-1, which may be obtained by cracking paraffin waxes, or a vinyl ester, ether, or ketone and numbers of these compounds are listed. The esters (2) may be derived from mono- or poly-carboxylic acids, and esters of **acrylic**, methacrylic, chloroacrylic, a -isopropylacrylic, a -amylacrylic, a -cyclohexylacrylic, a - hexylacrylic, maleic, chloromaleic, hexylmaleic, itaconic, glutaconic, aconitric, 2-pentenedioic, and 3-octenedioic acids are listed. The amides (3) may be derived from the unsaturated acids mentioned under (2) and, attached to the nitrogen atom of the amide group, they may have polar groups which

contain a non-metallic negative atom from Group V or VI of the Periodic Table. Examples of such amides are N-butanol, N-hexanol, and N - (3 - aminopropyl) - methacrylamide; N - (ethanol), N - (5 - carboxy - hexyl), N - morpholinoethyl, N - (dimethyl amino ethyl), N - (dimethylamino propyl), N-(6-mercapto-octyl), N - (6,6 - dihydroxyethyloctyl), N - (6 - cyanoethyl), N - (6 - hydroxyoctyl) - a - octyl and N - (6 - thiocyno - octyl) **acrylamide**; N, N-di - (6 - hydroxyoctyl) maleamide; N,N - di-(dimethylaminoethyl) itaconamide; and N,N-di - (mercaptobutyl) and N - (4 - hydroxyhexyl) butyl aconitamide. The monomers (2) and (3) may be reacted together first and the product e.g. N-(b - dimethylaminoethyl) **acrylamide** copolymerized with the alkene, e.g. n-octadecene-1. Additional polar groups may be introduced by conducting the polymerization in the presence of other polymerizable vinyl monomers, e.g. vinyl acetate, and such groups may be converted to hydroxyl groups by hydrolysis of the resulting **copolymer**. In an alternative and preferred method of preparation, the monomers (1) and (2) are first copolymerized and then treated with a primary or secondary amine, the N-atom of which bears at least one polar organic radical attached to the N-atom by an N-C linkage. Amines are listed and a sufficient quantity is used to convert at least 10 per cent but not more than 90 per cent of the alkoxycarbonyl groups into N-substituted carbamyl radicals. In examples: (1) a **copolymer** of octadecene-1 and methyl acrylate is prepared and reacted; (2) with N,N-dimethylaminopropyleneamine; (3) with N,N-diethylaminopropyleneamine; or (4) with monoethanolamine; (5) a **copolymer** of vinyl stearate and methyl acrylate is prepared and reacted with N,N-dibutylpropane-1,3-diamine or aminoethyl morpholine; (6) a **copolymer** of n-hexadecene-1 and methyl methacrylate is reacted with 4-aminobutyl mercaptan, 1-cyano-5-aminopentane or 1-thio-5-aminopentane; (7) a **copolymer** of octadecene-1 and methyl acrylate is reacted with 4-amino-butylaldehyde; (8) 4-aminopentanamide; (9) 4-aminopentanoic acid or (10) N-hydroxyethylethylenediamine; and (11) a methyl a -octadecyl acrylatevinyl acetate **copolymer** is reacted with N-aminoethylmorpholine. The polysubstituted alkanes may be used in **oil** compositions in minor amounts, e.g. from 0.001 to 10 per cent as sludge preventives, detergents, antiwear agents and antioxidants. They may be used in natural lubricants, e.g. hydrocarbon oils, alone or blended with castor or lard **oil**, or in synthetic lubricants such as polymerized olefines, copolymers of alkylene glycols and oxides, organic esters of polybasic organic and inorganic acids, e.g. di-(2-ethylhexyl sebacate), dioctyl phthalate and trioctyl phosphate, polymeric tetrahydrofuran and polyalkyl silicone polymers, e.g. dimethyl silicone polymer. They may also be used in greases, fuels (e.g. gasoline, gas **oil** or burner fuel **oil**), and slushing, industrial, metal working, drawing, quenching, and textile oils. Other conventional additives such as antioxidants, detergents, pour point depressants, viscosity index improvers, blooming agents, corrosion inhibitors, oiliness agents and **solubilizers** may also be present. Examples of such conventional additives are given. Specification 714,178 and U.S.A. 2,639,227 are referred to. ALSO: **Oil-soluble** polysubstituted long chain alkanes, suitable for use as hydrocarbon **oil** additives, contain attached to a plurality of the carbon atoms of the alkane chain a plurality of hydrolysis-resistant **oil solubilizing** radicals, each containing an uninterrupted hydrocarbon group of at least 8 carbon atoms, a plurality of alkoxycarbonyl radicals and a plurality of N-substituted carbamyl or thiocarbamyl radicals wherein at least one of the substituents to the N-atom is a polar organic radical attached to the N-atom by an N-C linkage, and the ratio of the average number of alkoxycarbonyl plus N-substituted carbamyl radicals to the number of hydrolysis-resistant **oil solubilizing** radicals is between 4 to 1 and 1.1 to 1 and at least 10 per cent but not more than 90 per cent of the total alkoxycarbonyl plus N-substituted

carbamyl radicals being N-substituted carbamyl radicals. The alkanes preferably of molecular weight between 2,000 and 150,000 are prepared by copolymerizing (1) an ethylenically unsaturated **monomer** having a single terminal ethylenic group and an uninterrupted chain of at least 10 carbon atoms; (2) an ester of an ethylenically unsaturated carboxylic **acid** and a lower alkanol; and (3) an N-substituted amide of an unsaturated carboxylic **acid** wherein at least one of the substituents to the N-atom is a polar organic radical attached to the N-atom by an N-C linkage. The **monomer** (1) is preferably a normal or branched chain α -olefine containing from 16 to 30 carbon atoms, e.g. n-hexadecene-1, n-octadecene-1, n-tricosene-1, and n-octacosene-1, which may be obtained by cracking paraffin waxes, or a vinyl ester, ether, or ketone and numbers of these compounds are listed. The esters (2) may be derived from mono- or polycarboxylic acids, and esters of **acrylic**, methacrylic, chloro-, α -isopropyl, α -amyl, α -cyclohexyl, α -hexylacrylic, maleic, chloromaleic, hexylmaleic, itaconic, glutaconic, aconitic, 2-pentandioic, 3-octenedioic acids are listed. The amides (3) may be derived from the unsaturated acids in (2) with functional groups which contain a non-metallic negative atom from Group V or VI of the Periodic Table, and examples are N-butanol, N-hexanol, and N-(3-aminopropyl)methacrylamide, N-(ethanol), N-(5-carboxyl-hexyl), N-morpholinoethyl, N-(dimethylaminoethyl), N-dimethylaminopropyl, N-(6-mercaptooctyl), N-(6,6-dihydroxyethyloctyl), N-(6-cyanoheptyl), N-(6-hydroxyoctyl)- α -octyl and N-(6-thiocyanoethyl) acrylamides, N,N-di-(6-hydroxyoctyl) maleamide, N,N-di-(dimethylaminoethyl) itaconamides, and N,N-di-(mercaptobutyl) and N-(4-hydroxyhexyl) butyl aconitamides. The reactants (2) and (3) may be copolymerized first and the product, e.g. N-(6-dimethylaminoethyl) **acrylamide** reacted with the alkene, e.g. n-octadecene-1, and additional polar groups incorporating other polymerizable monomers, e.g. vinyl acetate may be present and may be hydrolysed in the resulting **copolymer**. In an alternative and preferred method of preparation, the monomers (1) and (2) are first copolymerized and then treated with a primary or secondary amine, the N-atom of which bears at least one polar organic radical attached to the N-atom by an N-C linkage. The concentration of monomers is controlled so that the copolymers contain between 4 and 1.1, alkoxycarbonyl groups per unit derived from (1) by shortstopping the reaction or by adding monomers to maintain the concentration constant. The copolymers may be prepared in bulk, solution, or aqueous emulsion or suspension systems with catalysts such as hydrogen, benzoyl, lauroyl, and di-(t-butyl) peroxides, t-butyl hydroperoxides, 2,2-bis-(t-butyl peroxy) butane, t-butyl perlargonate sodium or potassium persulphates, percarbonate and peracetic **acid**, at an elevated **temperature**, under atmospheric, reduced or elevated pressures, and if desired in the absence of air. Chain transfer agents such as alcohols, aldehydes, ketones, ethers, halogenated hydrocarbons, alcohols, aldehydes, ethers or organic acids, **acid** halides, esters of inorganic esters, and amines, cyanogen and nitro compounds, sulphur halides, benzene sulphonyl chloride, mercaptans and related organic sulphur compounds may be present. Amines are listed and a sufficient quantity is used to convert at least 10 per cent but not more than 90 per cent of the alkoxycarbonyl groups into N-substituted carbamyl radicals. The components are mixed alone, or in a mutual solv

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 PN - [GB768701](#) A 19570220
 PR - USX768701 19530610
 AP - GB19540015455 19540525



- DT - *; Rep
- CCI - [C08F22/00](#) ; [C08F220/18](#) ; [C08F8/32](#) ;
[C10M143/00](#) ; [C10M145/02](#) ;
[C10M145/14](#) ; [C10M145/16](#) ;
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- CLC - [C08F8/32](#) , [C08F220/18](#) , INV
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[C10M2221/02](#) ; [C10M2223/041](#) ;
[C10M2227/02](#)
- PA - CALIFORNIA RESEARCH CORP
- TI - Copolymeric dispersants and lubricant compositions containing them
- AB - Copolymers of (A) an olefinically-unsaturated compound preferably containing an **oil-solubilizing** group of from 4 to 30 aliphatic carbon atoms, and (B) an alpha-beta-unsaturated carboxylic **acid**, in which some of the carboxyl groups are ester-linked to a poly-(1,2-alkylene oxide) glycol, and some are linked to a nitrogen-containing compound to form either of the radicals <FORM:0768701/IV(a)/1> and <FORM:0768701/IV(a)/2> where R1 is hydrogen or an organic radical and R2 an organic radical are made (1) by partially hydrolysing a homopolymer of an ester of an unsaturated **acid** and reacting the free carboxyl groups with the desired polyglycol and nitrogen-containing compound; (2) partially esterifying a **copolymer** of an olefinically-unsaturated **monomer** of

an alpha, beta-unsaturated **acid** or anhydride with a polyglycol and nitrogen-containing compound; or (3) polymerizing an appropriate **monomer** mixture. (A) may be selected from an extensive list including ethylene, hexene-1, cyclohexene and substituted cyclohexenes, p-octylstyrene, 2-hexadecylbutadiene-1,3, vinyl n-butyl ether, allyl cyclohexyl ether, methallyl n-hexyl ether, vinyl p-octylphenyl ether, 1-decenyl-2-phenylbutyl ether, vinyl caproate, allyl stearate, methallyl palmitate, dodecyl acrylate, cyclohexyl methacrylate, decyl vinyl acetate, p-tert. amylphenyl octadecyl maleate, di-2-ethylhexyl maleate, di-dodecyl mesaconate and citraconate, and 1-hexadecenyl myristate. The alpha, beta-unsaturated **acid** may be **acrylic**, methacrylic, crotonic, tiglic, angelic, alpha-ethylacrylic, beta-ethyl crotonic, maleic, fumaric, itaconic, glutaconic, citraconic, mesaconic or aconitic. The poly-(1,2-alkylene oxide) glycol may be diethylene glycol, pentaethylene glycol, nonaethylene glycol, tetra-1,2-propylene glycol, the monobutyl ether of heptaethylene glycol or a polymer of one or more 1,2-alkylene oxides of molecular weight up to 10,000 in which, if desired, at least one of the end groups is replaced by alkoxy or acyloxy groups. In the case of the nitrogen containing compound the organic radical may be methyl to heptadecyl, phenyl, tolyl, xylyl, benzyl, naphthyl, 2-hydroxyethyl, 4 - hydroxycyclohexyl, 3 - azapentyl, 4-amonoethyl, 2-mercaptoethyl, 3-aza-5 - hydroxypentyl, 2 - ethyl - 6 - aminohexyl, 2-nitrohexyl, p-aminophenyl, or 2-hydroxy-6-phenylhexyl. An extensive list of monomeric nitrogen-containing compounds is given including methacrylamide, N - ethylmethacrylamide, N-phenyl methacrylamide, N,N-di-(2-hydroxyethyl) -methacrylamide, the ethylamine or ethanolamine salt of methacrylic **acid**,

acrylamide, N,N - di - (2 - ethylhexyl)
- **acrylamide**, crotonamide, N - (2 - nitroethyl)-crotonamide, tiglamide, maleamic **acid**, maleamide, N,N1 - diethylmaleamide, N - phenylmaleamic **acid**, lauryl N-(2-hydroxyethyl)-maleate, tetraethylene pentamine salt of lauryl maleate, N,N1 - di - (2 - mercaptoethyl)-maleamide, dodecyl N-(p-aminophenyl)-maleate, fumaramic **acid**, erythritol monofumaramate, dodecyl N - (2 - hydroxyethyl) - citraconamate. The copolymers may be prepared by bulk, solution or emulsion techniques in the presence of a catalyst. The copolymerization is preferably effected in an inert solvent such as benzene, toluene, xylene, or petroleum naphtha. Catalysts mentioned are benzoyl, acetyl, di-tert. butyl, and di-tert. amyl peroxides, 1,11-azodicyclohexanecarbonitrile, and alpha, alpha1 - azodiisobutyronitrile. In examples: (a) a **copolymer** of dodecyl methacrylate, polyethylene glycol methacrylate, N-octyl-methacrylamide and methacrylic **acid** is made by partially hydrolysing a homopolymer of dodecyl methacrylate and reacting with a mixture of polyethylene glycols which includes a major proportion of nonaethylene glycol and then with n-octylamine; (b) a **copolymer** of dodecyl methacrylate, polyethylene glycol monoether methacrylate and N - (2 - hydroxyethyl) - methacrylamide is similarly made; (c) a **copolymer** of vinyl 2-ethyl hexyl ether, **acrylic acid**, methacrylamide, and polypropylene glycol acrylate is made by copolymerizing the ether, **acid**, and amide in bulk, and esterifying the product with 2-propylene glycol; (d) a **copolymer** of dodecyl methacrylate, the methacrylate of a polyglycol mono-octyl ether and maleic anhydride is reacted first with pentaerythritol and then with isooctadecylamine; (e)

a **copolymer** of tridecyl acrylate, the methacrylate of polyethylene glycol monoethyl ether and methacrylic **acid** is treated with p-nitroaniline; (f) the **copolymer** of (e) is reacted first with glycerol and then with n-octylamine.

ALSO: A lubricant composition comprises a major proportion of an **oil** of lubricating viscosity and a minor proportion of an **oil-soluble copolymer** (see Group IV(a)) of (A) an olefinically-unsaturated compound, and (B) an alpha, betaunsaturated carboxylic **acid**, in which a portion of the carboxylic groups of the **acid** are ester-linked to a poly-(1, 2-alkylene oxide) glycol and another portion of the carboxyl groups are linked to a nitrogen-containing compound to form radicals selected from <FORM:0768701/III/1> or <FORM:0768701/III/2> where R1 is hydrogen or an organic radical and R2 an organic radical. The compositions may also contain pour point depressants, oiliness and extreme pressure agents, antioxidants corrosion inhibiting agents, blooming agents, thickening agents, detergents, anti-wear agents or compounds for enhancing the **temperature** -viscosity characteristics of oils. Oils mentioned are refined Pennsylvania or other paraffin base **oil**, a refined naphthenic base **oil**, alkylated waxes, hydrogenated hydrocarbon polymers, the condensation products of chlorinated alkyl hydrocarbons with aryl compounds, polymers of propylene and/or ethylene oxide and acetates of these polymers, di - (2 - ethylhexyl) sebacate, tricresyl phosphate, silicate esters, or a mixture of a mineral **oil** and a synthetic **oil**. Polymers exemplified in **oil** compositions are (1) a **copolymer** of dodecyl methacrylate/polyethylene glycol methacrylate/N - octyl - methacrylamide (2) a **copolymer** of dodecyl methacrylate/polyethylene glycol monoether methacrylate/N - (2 -

hydroxyethyl) methacrylamide, (3)
a **copolymer** of vinyl 2 - ethyl-hexyl
ether/methacrylamide/ **acrylic**
acid/polypropylene glycol acrylate (4)
a **copolymer** of dodecyl
methacrylate/polyglycol ether
methacrylate/pentaerythritol
maleate/maleic **acid** amine salt (5)
a **copolymer** of allyl stearate/di -
tridecyl maleate-mono - tridecyl
polyglycol maleate/ethanolamine salt
of mono-tridecyl maleate-monotridecyl
maleate, (6) a **copolymer** of tridecyl
acrylate-polyethylene glycol ether
methacrylate/N - (p - nitrophenyl)
methacrylamide-methacrylic **acid**, and
(7) a **copolymer** of tridecyl
acrylate/polyethylene glycol ether
methacrylate/glycerol
monomethacrylate/octyl amine salt of
methacrylic **acid**. The function of
the **copolymer** in the **oil** is that of a
detergent.

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- CCA - [C10M2219/04](#) ; [F02B3/06](#) ; [F02B47/00](#)
- AB - Aqueous dispersions of copolymers of at least 70 weight per cent of vinylidene chloride and 0.5 to 5 weight per cent of a component (i) comprising at least one monoethylenically unsaturated carboxylic **acid** or anhydride or partial ester thereof and 4 to 29.5 weight per cent of a component, (ii) comprising at least one monoethylenically unsaturated **monomer** other than a carboxylic **acid** or anhydride or partial ester thereof, said components (i) and (ii) each being **soluble** in water to the extent of at least 0.5 gm. per 100 c.c. at the **temperature** of polymerization, are prepared by polymerizing the vinylidene chloride and said components (i) and (ii) in aqueous medium in the presence of a water **soluble** salt of a peroxy **acid** and a sulphur-containing **acid** having reducing properties or an alkali metal salt thereof, and in the presence of less than 0.1 weight per cent based on the total **monomer** of any ionic emulsifying or dispersing agents and less than 2% by weight based on the total **monomer** of any non-ionic emulsifying or dispersing agents. Specified components (i) are **acrylic**, methacrylic, vinylacetic, crotonic, maleic, fumaric, itaconic, aconitic, citraconic and mesaconic acids and anhydrides and partial esters thereof. Specified components (ii) are acrylonitrile, methacrylonitrile, methyl acrylate, ethyl acrylate, methyl methacrylate, **acrylamide**, methacrylamide, vinyl chloride, methyl vinyl ether, ethyl vinyl ether, methyl vinyl ketone

and acrolein. Specified catalysts are alkali metal and ammonium peracetates, percarbonates and persulphates, and sulphurous **acid** and alkali metal sulphites, hydrosulphites, thiosulphates, formaldehyde sulphonylates and metabisulphites. Non-ionic surface active agents, e.g. polyoxyethylated alcohols and alkyl phenols and esters thereof, hydrolysed polyvinyl acetate and ethylene oxide/propylene oxide copolymers; small proportions of ionic surface active agents, e.g. alkali metal sulphates and sulphonates of long chain alcohols; and chain transfer agents may also be present. The dispersions have narrow particle size ranges, and dispersions of different particle size ranges may be blended. Emulsions of waxes, e.g. candelilla wax, may be added. The dispersions may be used for coating substrates such as metal foils, paper, cardboard and films of thermoplastic polymeric materials. Examples describe the copolymerization in aqueous dispersion in the presence of ammonium persulphate and sodium metabisulphite of vinylidene chloride and (1,2,5 and 15) acrylonitrile and **acrylic acid**, (3) acrylonitrile and methacrylic **acid**, (4) vinyl chloride and **acrylic acid** and (10) acrylonitrile and monobutyl itaconate; the addition to vinylidene chloride/acrylonitrile/ **acrylic acid copolymer** dispersions of (7) polyoxyethylated sorbitan monostearate, polyoxyethylated nonyl phenol and sodium salt of sulphonated diesel **oil**, and (14) a dispersion of candelilla wax; and (12) the blending of dispersions of vinylidene chloride/acrylonitrile/**acrylic acid** copolymers of different particle sizes. ALSO: Substrates, e.g. of metal, paper, cardboard or thermoplastics, are coated with aqueous dispersions of copolymers of at least 70 weight per cent vinylidene chloride, (i) 0,5-5 weight per cent of a monoethylenically unsaturated carboxylic **acid**, anhydride or partial ester, and (ii) 4-29,5 weight per cent of at least one other **monomer**, said monomers (i) and (ii) being **soluble** in water to the extent of at least 0,5 gm. per 100 c.c. at the **temperature** of polymerization, prepared by copolymerizing the monomers in aqueous medium containing a water **soluble** salt of a peroxy **acid** and a reducing, sulphur-containing **acid** or alkali metal salt thereof, less than 0,05 weight per cent of any ionic and less than 2 weight per cent of any non-ionic emulsifying or dispersing agents, based on the weight of monomers. The substrates may be of aluminium, aluminium foil/paper laminates, or thermoplastics such as polyethylene, polypropylene, polyvinyl fluoride, vinyl chloride polymers, cellulose acetate, regenerated cellulose and polyethylene terephthalate, which may be in the form of films, or sheets, channels or tubes which may be fabricated, e.g. into containers, after coating. The substrates may be degreased before coating, and substrates such as polypropylene films may be pretreated with a corona discharge to improve adhesion. **Copolymer** dispersions of different particle size may be blended, and emulsions of waxes, e.g. candelilla wax, may be incorporated. Examples described the coating of aluminium foil with aqueous dispersions of (5) a vinylidene chloride/**acrylic acid**/acrylonitrile **copolymer**, with and without (7) polyethoxylated sorbitan monostearate, polyethoxylated nonyl phenol or sodium sulphonate of diesel **oil**; and (10) a vinylidene chloride/monobutyl itaconate/acrylonitrile **copolymer**; the coating of corona discharge treated biaxially oriented polypropylene film with aqueous dispersions of (6) a vinylidene chloride **acrylic acid**/acrylonitrile **copolymer**, with and without (8) polyethoxylated nonyl phenol; (12) a mixture of vinylidene chloride/**acrylic acid**/acrylonitrile copolymers of different particle size, and (14) a vinylidene chloride/ **acrylic acid**/acrylonitrile **copolymer** and candelilla wax dispersion; the coating of regenerated cellulose film with aqueous dispersions of (11) vinylidene chloride/ **acrylic acid**/acrylonitrile copolymers or vinylidene chloride/monobutyl itaconate/acrylonitrile copolymers, with and without sodium dodecylbenzene

sulphonate; and the coating of polyvinyl chloride sheets with aqueous dispersions of (15) vinylidene chloride/**acrylic acid**/acrylonitrile copolymers.

[SS 10]