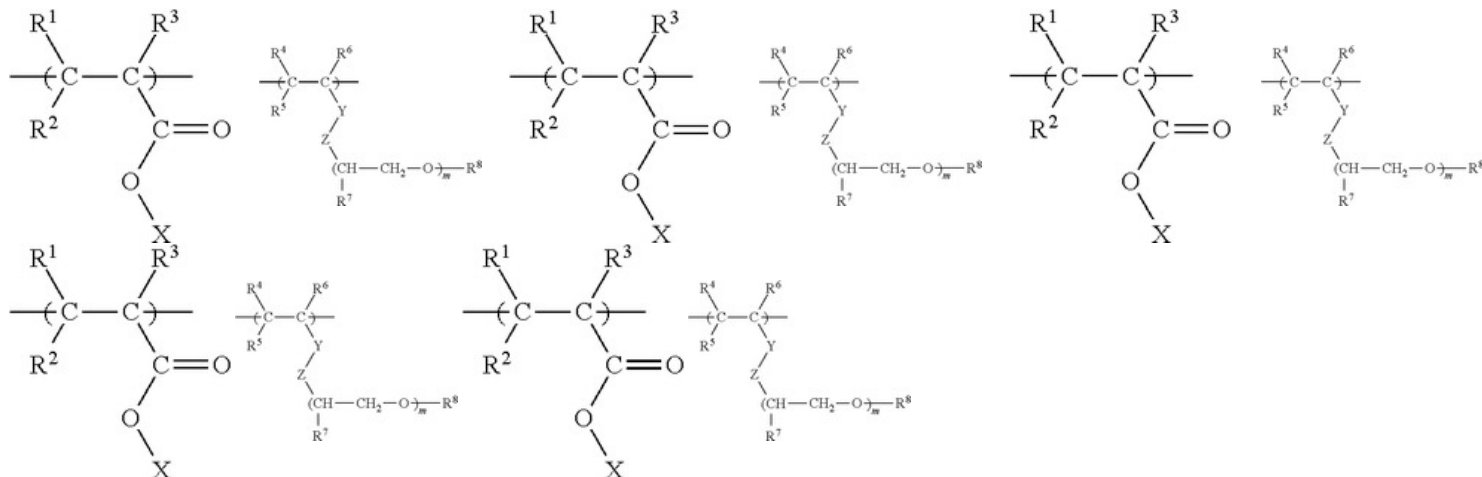
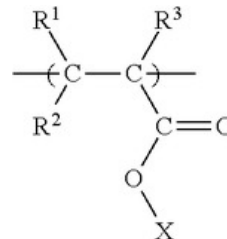


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#	Title	Publication number	1st App. date	Applicant/Assignee	1st Publ. date	Publ. date
1.	Low-to-mid-range water reduction using polycarboxylate comb polymers	US2016090323	2015-02-17	GCP APPLIED TECHNOLOGIES* GCP APPLIED TECHNOLOGY WR GRACE	2016-03-31	2016-03-31
Methods for plasticizing cementitious mixtures having relatively high water/cement ratio (at least 0.40 or higher) are surprisingly improved in terms of dosage efficiency, compared to conventional "superplasticizer" polycarboxylate polymers, when the polycarboxylate polymer is formed from particularly small-sized, specifically selected monomer constituents: (A) polyoxyalkylene monomer represented by the structural formula (R¹)(R³)C(R²)(CH₂)_m(CO)_nO(CH₂)_p(AO)_pR⁴ wherein (AO)_p represents linear ethylene oxide groups and p is 5-23 and more preferably 5-15; (B) unsaturated carboxylic acid represented by (R⁵)(R⁷)C(R⁶)(C(O)OM) wherein M represents an alkali metal, the ratio of component A to component B being 20:80 to 50:50; and, optionally, (C) a hydrophilic monomer represented by (R⁸)(R⁹)C(R¹⁰)(X) wherein R⁸, R⁹, and R¹⁰ each represent hydrogen or methyl group, and X represents C(O)NH₂, C(O)NHR¹¹, C(O)NR¹²R¹³, SO₃H, C₆H₄SO₃H, or C(O)NHC(CH₃)₂CH₂SO₃H, or mixture thereof, wherein R¹¹, R¹², and R¹³ each represent a C1 to C5 alkyl group.						
2.	Low-to-mid range water-reducing polymer with mixed polyoxyalkylene side chains	US2017320777	2016-05-03	GCP APPLIED TECHNOLOGY*	2017-11-09	2017-11-09
Methods for plasticizing cementitious mixtures having relatively high water/cement ratio (at least 0.40 or higher) are surprisingly improved in terms of dosage efficiency, compared to conventional "superplasticizer" polycarboxylate polymers, when the comb-type carboxylate copolymer is formed from two different polyether side chains, specifically selected monomer constituents: (A) first polyoxyalkylene monomer represented by structural formula (R¹)(R³)C(R²)(CH₂)_m(CO)_nO(CH₂)_p(AO)_pR⁴ wherein (AO)_p represents linear alkylene oxide and p is an integer of 5-23; (B) second polyoxyalkylene monomer represented by structural formula (R¹)(R³)C(R²)(CH₂)_m(CO)_nO(CH₂)_q(AO)_qR⁴ wherein (AO)_q represents linear alkylene oxide groups and q is an integer of 20 to 200; (C) unsaturated carboxylic acid monomer represented by (R⁵)(R⁷)C(R⁶)(C(O)OM) wherein M represents an alkali metal, and the ratio of component A to component B is 20:80 to 50:50; and, optionally, (D) a water-soluble monomer represented by (R⁸)(R⁹)C(R¹⁰)(X) wherein R⁸, R⁹, and R¹⁰ each represent hydrogen or methyl group, and X represents C(O)NH₂, C(O)NHR¹¹, C(O)NR¹²R¹³, OR¹⁴, SO₃H, C₆H₄SO₃H, or C(O)NHC(CH₃)₂CH₂SO₃H, or mixture thereof, wherein R¹¹, R¹², R¹³, and R¹⁴ each represent a C1 to C5 alkyl group.						
3.	Optimizing polycarboxylate admixtures for cementitious compositions	US2016362337	2015-06-15	GCP APPLICATION TECHNOLOGY GCP APPLIED TECHNOLOGIES GCP APPLIED TECHNOLOGY*	2016-12-15	2016-12-15
The present invention provides a composition and method for modifying a hydratable cementitious composition such as concrete or mortar using at least three different, distinct carboxylate polymers, even when clay is present in the concrete or mortar that would otherwise diminish dosage efficiency of polycarboxylate polymer used as dispersant. The three polycarboxylate polymers, designated as Polymer I, Polymer II, and Polymer III, are derived from monomer Components A, B, and C wherein Component A is an unsaturated carboxylic acid, Component B is a polyoxyalkylene, and Component C is an unsaturated carboxylate ester. The component molar ratio ranges for A:B:C are different as between Polymers I and II; while a distinct component molar ratio A:B:C is identified for Polymer III. When treated with these three different polycarboxylate polymers, the hydratable cementitious composition is surprisingly enhanced in terms of initial workability and slump retention, especially if clay is present.						
4.	Cement additive and cement composition using the same	WO2007062711	2005-12-01	CONSTRUCTION RESEARCH & TECHNOLOGY*	2007-06-07	2007-06-07
A cement additive is provided which has a good autogenous shrinkage reducing effect and reduces the viscosity of concrete, and wherein compound A, which is a polycarboxylate copolymer, and other compounds are indispensable components.						

The present invention provides compositions and methods involving the use of a carboxylate graft polymer having high molecular weight and low ratio of acid-to-polyoxyalkylene groups. Such clay-mitigation is particularly useful for treating clay and clay-bearing aggregates, particularly those aggregates used for construction purposes. The present invention minimizes the need to wash the aggregates, thus preserving fine aggregates ("fines") content in construction materials, and thereby benefiting the performance and/or properties of construction materials containing the clay-bearing aggregates.



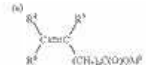
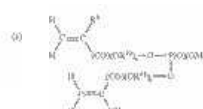
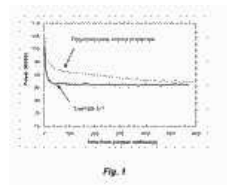
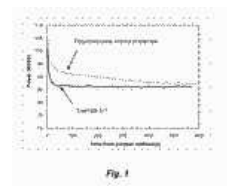
6. Phosphate-containing polycarboxylate polymer dispersants US8058377

2010-06-24

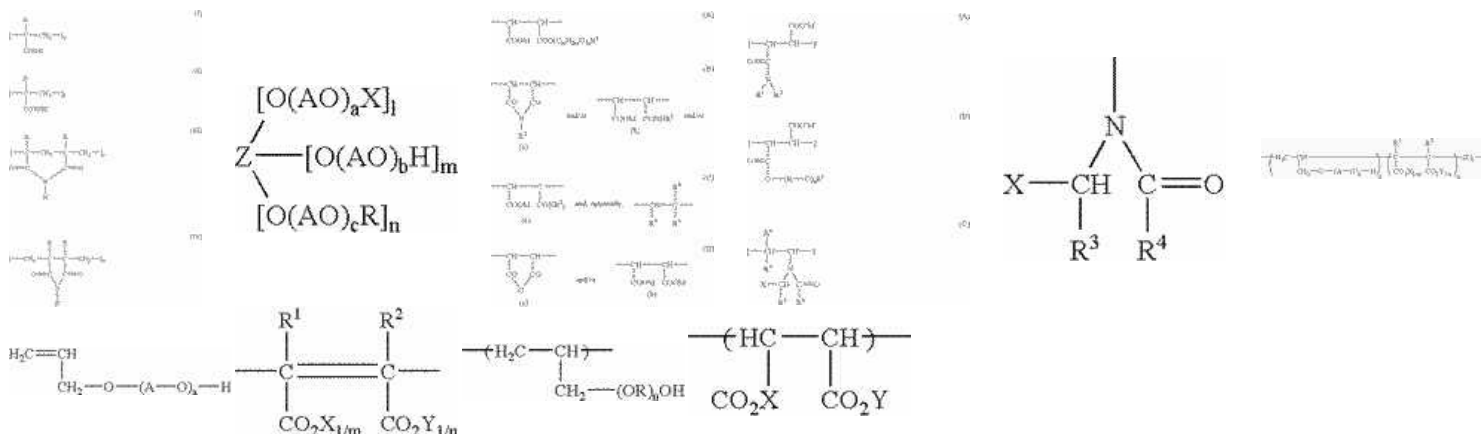
GCP APPLIED TECHNOLOGIES*
 WR GRACE

2011-11-15 2011-11-15

Phosphate-containing polycarboxylate polymer dispersant compositions of the invention comprise a polymer made from polyoxyalkylene groups, acrylic acid groups, mono-ester groups, and optionally di-ester and tri-ester groups, all in specific molar ratios. The polymer dispersants of the invention achieve quick mix-in dispersibility, particularly within hydratable cementitious compositions such as concrete, in comparison with polycarboxylate polymer dispersants that do not contain phosphate groups, while having improved initial slump as well as slump retention compared to phosphate-containing polymers of the prior art.



An exemplary admixture system for cementitious compositions, comprises a polycarboxylic acid type water reducer and a tertiary amine defoamer having an average molecular weight of 100-1500 and more preferably 200-750. The defoamer permits a stable admixture formulation and helps to achieve a controllable level of entrained air in a concrete mix. Cementitious compositions and methods for modifying the same, using the tertiary amine defoamers, are also described herein.



8.	Robust polycarboxylate containing ether linkages for milling preparation of cementitious materials	WO2010085425	2010-01-15	GCP APPLIED TECHNOLOGIES NIPPON SHOKUBAI* WR GRACE*	2010-07-29	2010-07-29
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The present invention discloses compositions and methods wherein polycarboxylate comb polymers are used as grinding additives. The comb polymers contain a carbon-containing backbone and pendant groups wherein oxyalkylene pendant groups contain one or more ether linkage groups for providing robustness to the polymer for resisting degradation during grinding and hence sustaining workability and strength of hydratable cementitious materials, such as cements, pozzolans, limestone, and other cementitious materials.

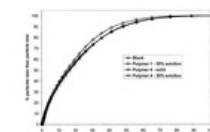
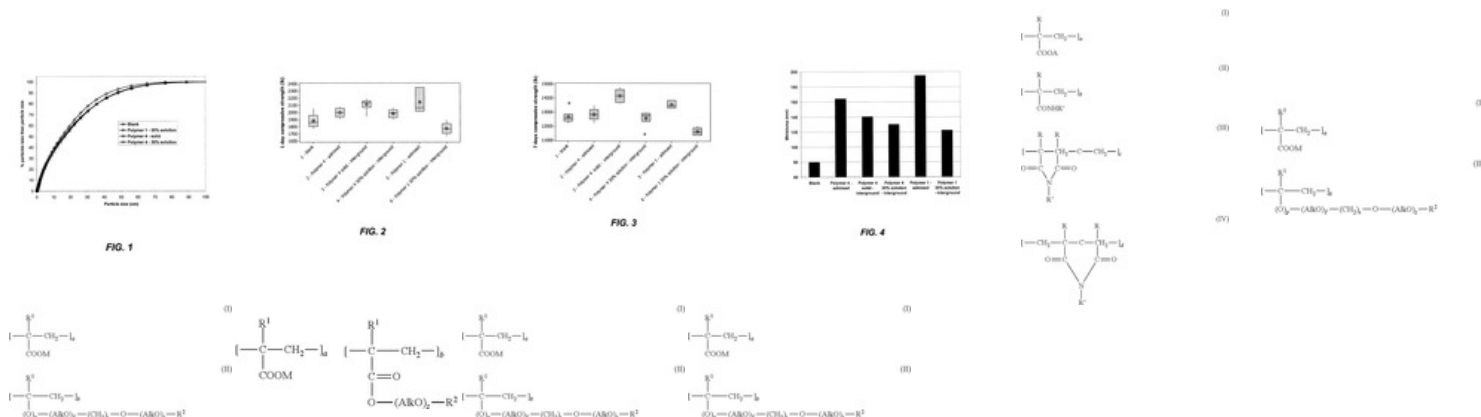


FIG. 1



9.	Emulsified comb polymer and defoaming agent composition and method of making same	WO9831643	1998-01-20	GCP APPLIED TECHNOLOGIES* WR GRACE	1998-07-23	1998-07-23
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Exemplary emulsion admixture for use in hydraulic cement compositions formed by emulsifying an antifoaming agent, surfactant, and a comb polymer having a carbon-containing backbone to which are attached cement-anchoring members and oxyalkylene groups. A method of making a stable emulsion admixture comprising the comb polymer, as well as a hydraulic cement composition comprising the admixture, are also described.

10.	Integrally waterproofed concrete	WO2006041698	2005-09-28	GCP APPLIED TECHNOLOGIES* WR GRACE	2006-04-20	2006-04-20
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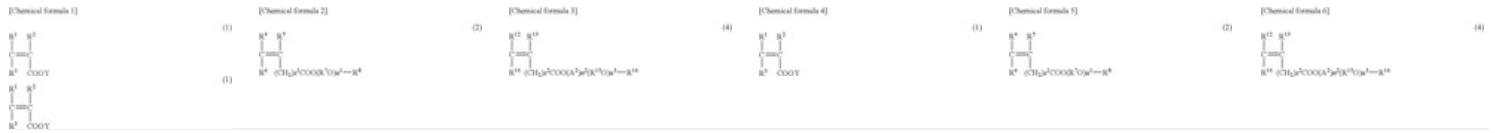
An exemplary composition for enhancing water repellency in cementitious material comprises a hydrophobic material solute that is dissolved in a glycol ether solvent. Thus, the composition is provided in the form of a non-aqueous solution or emulsion wherein water is in noncontinuous phase. The use of such compositions to modify cementitious compositions and the cementitious materials obtained thereby are also described.

HYDROPHOBE®. DARAPEL®. Carbowax® ADVA®. Adva®. Darapel®

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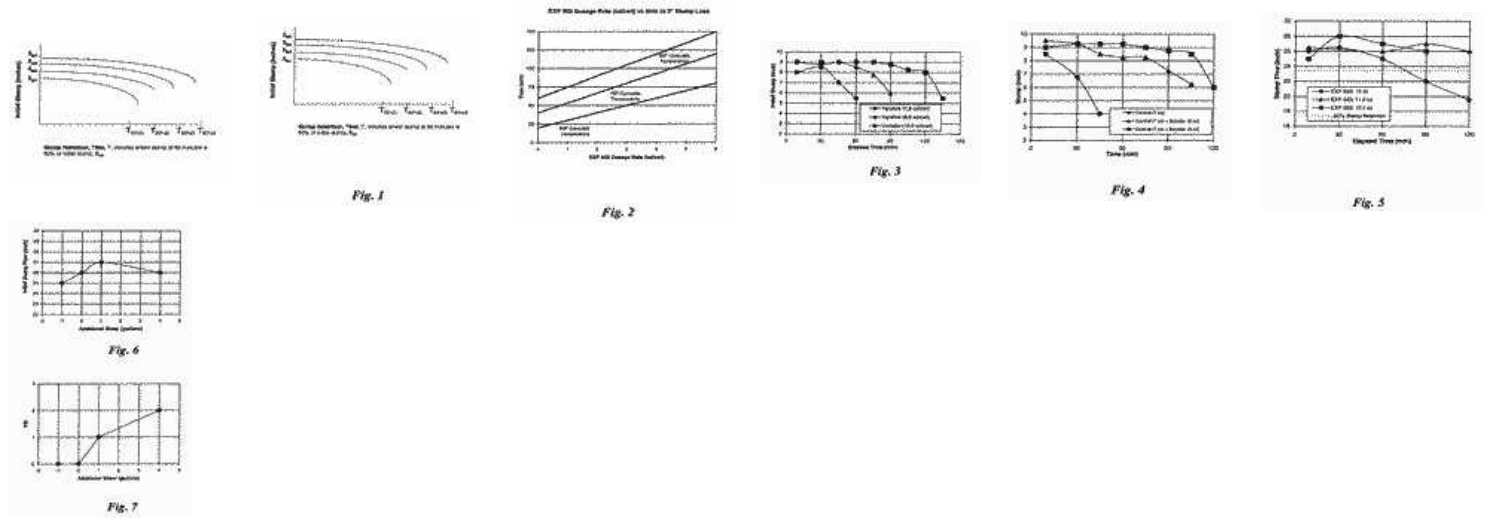
11. Cement additive and cement composition using the sameUS20100164762009-09-01KINOSHITA TAKASHI;SUGAMATA TAKUMI;YAGUCHI MINORU2010-01-212010-01-21

A cement additive is provided which has a good autogenous shrinkage reducing effect and reduces the viscosity of concrete, and wherein compound A, which is a polycarboxylate copolymer, and ether compounds are indispensable components.



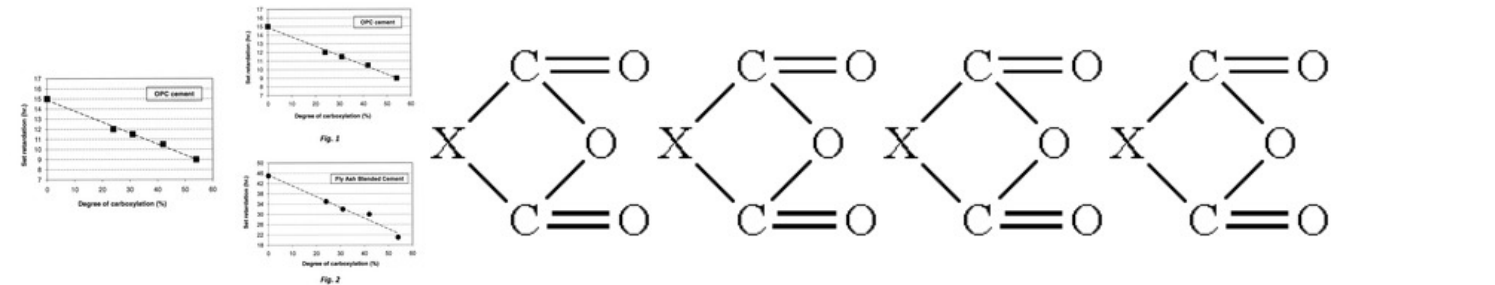
12. Slump retention in cementitious compositionsWO20070474072006-10-12GCP APPLIED TECHNOLOGIES*WR GRACE2007-04-262007-04-26

The present invention relates to dispersants such as superplasticizers for hydratable cementitious compositions, and more particularly to methods for achieving variable degrees of longer slump life in concrete and mortar without loss of stability. This is achieved by using two admixture systems. The first admixture composition has multi-components for achieving initial- slump-enhancement, later-slump-retention, and limiting initial slump. The second admixture composition has the later-slump-enhancing component. Alternatively, conventional water reducers or superplasticizers can be employed initially, followed by the later-slump-enhancing admixture composition.



13. Carboxylated-carboxylic polyglycerol compositions for use in cementitious compositionsUS20122794262011-05-06GCP APPLIED TECHNOLOGIES*WR GRACE2012-11-082012-11-08

The invention relates to compositions and methods for modifying cementitious materials such as by reducing setting time. Polymer compositions of the invention are derived by polyetherifying mono-glycerols, optionally with alkylene glycols, to obtain polyglycerol homopolymers or copolymers, and then carboxylating the obtained polyglycerol homopolymers and/or copolymers with an organic acid having at least two carboxylic functionalities. The set retardation effect of the carboxylated-carboxylic polyglycerol polymer compositions in cementitious materials is reduced is compared to polyglycerol polymer not having the carboxylated-carboxylic groups, while its water reducing ability is maintained without loss of early compressive strength. Cementitious compositions and methods involving the carboxylated-carboxylic polyglycerol are also covered by the invention.



14. Polyalkoxylated polyamine oxide defoaming compositionsCA29863862015-05-19GCP APPLICATION TECHNOLOGYGCP APPLIED TECHNOLOGIESGCP APPLIED TECHNOLOGY*2016-11-242016-11-24

The present invention provides a composition and method for controlling air voids in aqueous systems such as paints, coatings, sealants, adhesives, mastics, cements, mortar, masonry, or concrete, which comprises the reaction product of an oxidizing agent and a compound comprising at least one polyalkoxylated polyalkylene polyamine, at least one polyalkoxylated polyethyleneimine, or a mixture thereof.

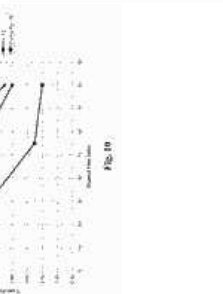
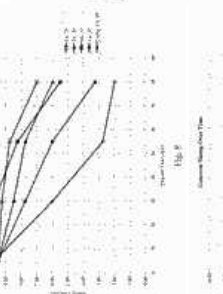
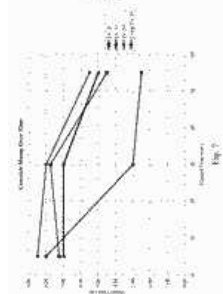
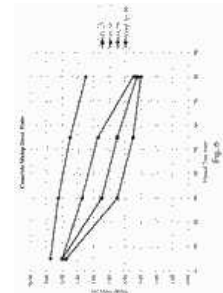
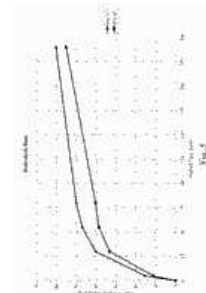
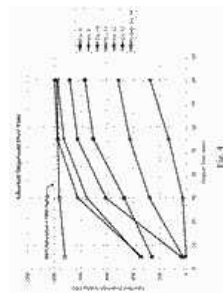
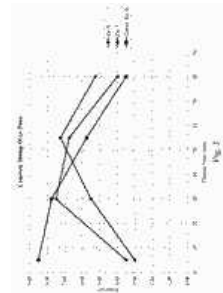
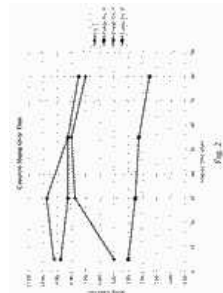
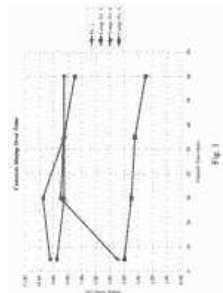
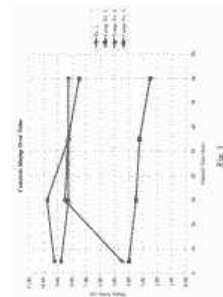


15. Hard surface cleaning composition containing polyacrylate copolymers as performance boostersCA20043101989-11-30BASF*1990-11-051990-11-05

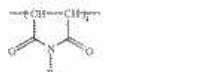
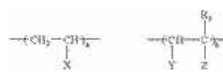
A clear, aqueous hard surface, essentially streak free, cleaning composition, comprising (a) a surfactant selected from the group of (i) polyoxyethylene/polyoxypropylene block copolymers having a number average molecular weight of from about 3000 to 7000, a percent hydrophile content of about 10 to 60 percent (ii) an alcohol ethoxylate of the formula (Chemical Structure image '1' not included in text) wherein R is an alkyl chain whose length is from about 8 to 15 carbon atoms, x is a number from about 4 to 15, y is a number from about 0 to 15, and z is a number from about 0 to 5, and mixtures thereof; and (b) 3 to 5 percent by weight organic solvents and water. The composition may also include a synergistic amount of a polycarboxylate copolymer comprised of a combination of copolymerized monomer units, monoethylenically unsaturated mono- and dicarboxylic acids, diolefins and alkyl vinyl ethers. The general structure of said copolymer is as follows: (Chemical Structure image '2' not included in text) wherein X.dbd.H, Na, or similar alkaline metals; A.dbd.H, COOH, COONa or similar salts, or an alkyl group having a chain length of 6 to 20 carbon atoms and preferably 6 to 10 carbon atoms, and m and n are numbers such that the monomer ratio is in the range of about 3:1 to 1:3 and a total average molecular weight of the copolymer is from 1,000 to 70,000.

The present invention provides a composition and method involving the use of at least one cement dispersant mixed with a diphosphonic or triphosphonic acid or salt as a slump retention-enhancing agent that is chemically unreacted with the at least one cement dispersant, such that, when introduced into the aqueous environment of a cementitious mixture, slump retention-enhancing agent molecules move independently of cement dispersant molecules with respect to the cement particles.

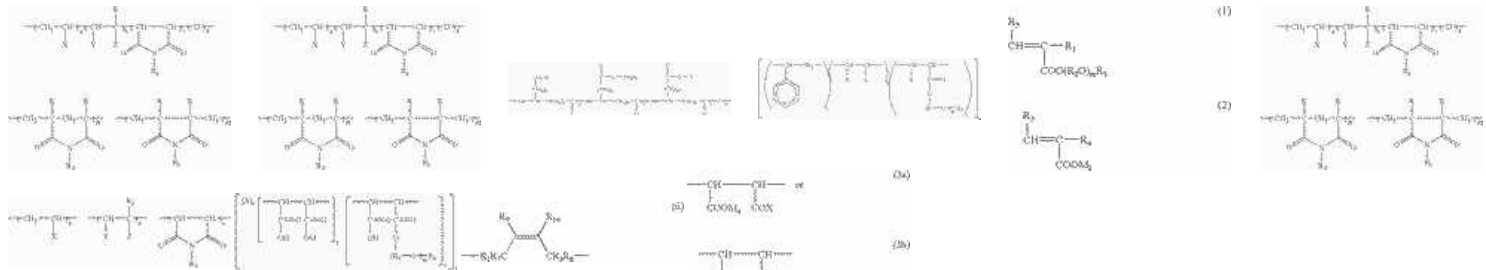
Preparing a non-ionic copolymer having a hydrolysable monomer residue and a polyether macromonomer residue in a semicontinuous mode in a polymerization reactor associated with a metering device, including introducing polyether macromonomer and water into the reactor, wherein hydrolysable monomer which is added thereto forms a polymerization reaction mixture; introducing hydrolysable monomer into the metering device; adding hydrolysable monomer into the reactor from the metering device; passing a free radical polymerization initiator into the reactor before and/or during the addition of the hydrolysable monomer, the hydrolysable monomer and the polyether macromonomer reacting by free radical polymerization to form the non-ionic copolymer; and, subjecting the reaction mixture to polymerization while an addition rate of the hydrolysable monomer and/or at least a component of the polymerization initiator is varied stepwise or continuously. No monomer is introduced to incorporate ionic cement binding sites into the non-ionic copolymer.



Amine solubilizing agents are mixed with water insoluble defoamers and optionally a dispersant for cementitious compositions to provide an admixture for cementitious compositions that is stable over time. A cementitious composition is provided that includes cementitious material, water, a water insoluble defoamer, optionally a dispersant for cementitious compositions, and an amine solubilizing agent that solubilizes the water insoluble defoamer. A method is provided for making a cementitious composition that includes mixing cementitious material, water, a water insoluble defoamer, an amine solubilizing agent that solubilizes the water insoluble defoamer, and optionally a dispersant for cementitious compositions.



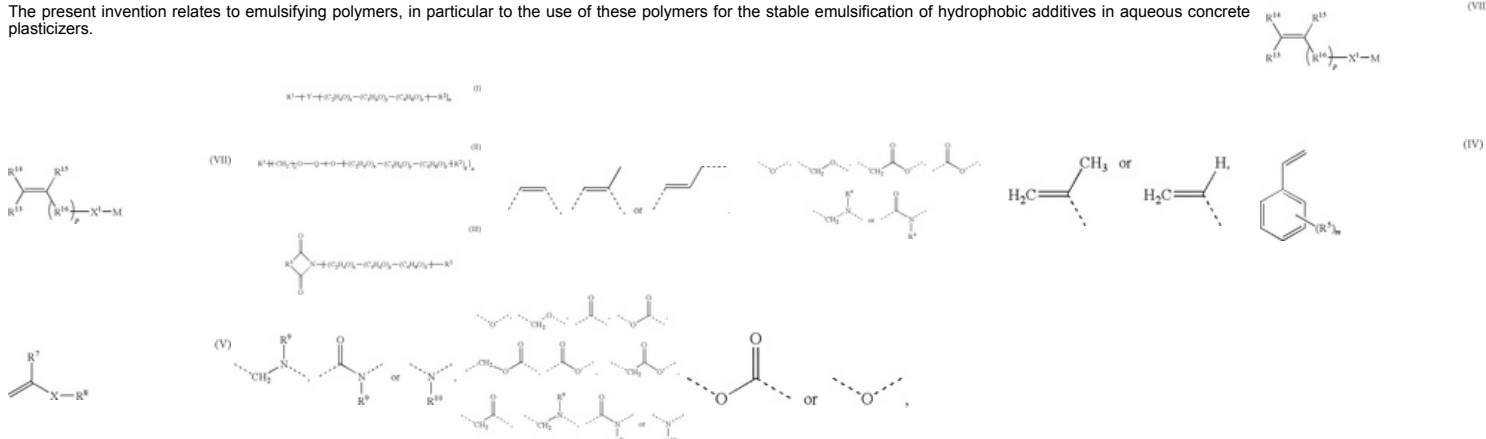
A cold-weather admixture composition that accelerates the setting time and strength development of cementitious compositions is provided which comprises the components of a soluble inorganic salt having freezing point depressing properties, an inorganic early set and strength accelerator, a polycarboxylate high range water reducing dispersant, and an organic set accelerator. With lower dosages of dispersant than those disclosed in the prior art the admixture composition provides to concrete increased dispersant performance and acceleration of setting time and strength development.



The invention provides a method for making a concrete floor slab using sub-grade waterproofing in a manner that favors the use of water-based adhesives (20) for affixing floor covering materials (22). The method comprises casing a hydratable cementitious composition (18) onto a flooring membrane (14), by waterproofing adhesive (16), the composition having a shrinkage reduction admixture and a water/cementitious binder ratio sufficiently low that substantially all of the water moisture is retained in the hydration reaction, and achieving a fully adhered bond with the flooring membrane.



The present invention relates to emulsifying polymers, in particular to the use of these polymers for the stable emulsification of hydrophobic additives in aqueous concrete plasticizers.

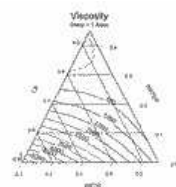
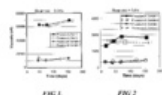
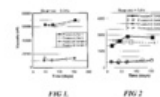


The present invention relates to modification of hydratable cement and cementitious materials, such as mortar cement and masonry or ready-mix concrete using ketone alcohol oil waste ("KAOW") material, obtained as an alkali-soluble liquor waste byproduct at a certain stage in the commercial production of cyclohexanol and cyclohexanone. Preferred applications for KAOW are in chemical admixture formulations whereby KAOW is used to substitute for a portion of a cement dispersant such as sodium lignosulfonate, sodium gluconate, or other conventional dispersant. Another preferred use is in mortar cement and masonry concrete units such as blocks, pavers, curbstones, and other concrete masonry units wherein air void systems advantageously foster freeze-thaw durability.



23.	Viscosity modifying agents and water reducers	US2004072939	2002-10-11	WR GRACE*	2004-04-15	2004-04-15
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The present invention relates to a process for making a stable suspension comprising a polycarboxylate superplasticizer and a viscosity modifying agent for modifying a hydratable cementitious composition. A composition for modifying cementitious compositions, as well as the cementitious compositions, are also described herein.



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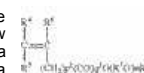
Fig. 3

24.	Method for modifying clay-activity and enhancing slump retention of hydratable cementitious compositions comprising clay-containing aggregates	WO2010005117	2008-07-11	GCP APPLIED TECHNOLOGIES* GCP APPLIED TECHNOLOGY WR GRACE	2010-01-14	2010-01-14
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The present invention relates to the use of polycationic compound in combination with a hydroxycarboxylic acid or salt thereof to enhance slump retention in cements and concretes having clay-bearing aggregates, wherein the clay otherwise absorbs or diminishes the dosage efficiency of polycarboxylate superplasticizers.

25.	Polycarboxylic acid cement dispersant and method for producing concrete secondary product	EP1466930	2004-04-07	NIPPON SHOKUBAI*	2004-10-13	2004-10-13
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The polycarboxylic acid cement dispersant of the present invention can exhibit high dispersing ability and allow deforming in early stages in the case of producing concrete products, whereby the turnover of a formwork is increased so as to improve productivity, and the method of producing a concrete product of the present invention can allow deforming in early stages, whereby the turnover of a formwork is increased so as to improve productivity. The polycarboxylic acid cement dispersant which provides a cement composition having a penetration resistance value exponent of 55 MPa or more and a slump retention exponent of 80% or more, and the method of producing a concrete product which makes use of a copolymer derived by using monomer components comprising the monomer (A) as polyalkylene glycol unsaturated monomer, the monomer (B) as unsaturated carboxylic monomer, and the monomer (C) as sulfonic acid group-containing monomer.



13

