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Combination sets

Fields of Olefin- Vinylic- Acrylic- and Grafts- Polymers
C08F10 to 301



Content

- Scope
- C08F based on chemical structure
- Rules for classification
  - CPC definitions
  - INV vs ADD
  - Classification in practice
  - Grafts
- Graft and block copolymers
- Neighbouring fields adhesives, coatings, cosmetics...
- Tips for search
- Examples of classification

Scope of C08F

Main Trunk

Breakdown or mirrored Indexing Codes

Parts	Topic
C08F2/00 - C08F2/60	Process
C08F4/00 - C08F4/58	Catalysts
C08F4/60 - C08F4/82	Transition Metal Cata
C08F6/00 - C08F6/28	Post treatments
C08F8/00 - C08F8/50	Post Modification
C08F10/00 - C08F10/14	Polyolefins Homo and Copolymers
C08F12/00 - C08F12/36	PS Homo and Copolymers
C08F14/00 - C08F14/28	Halogens Homo and Copolymers
C08F16/00 - C08F18/24	PVOH, PVOAc Homo and Copolymers
C08F20/00 - C08F34/04	Acrylates Homo and Copolymers
C08F36/00 - C08F36/22	Rubbers Homo and Copolymers
C08F38/00 - C08F38/04	Acetylenes Homo and Copolymers
C08F110/00 - C08F110/14	Polyolefins Homopolymers
C08F112/00 - C08F112/36	PS Homopolymers
C08F114/00 - C08F114/28	Halogens Homopolymers
C08F116/00 - C08F118/18	PVOH, PVOAc Homopolymers
C08F120/00 - C08F134/04	Acrylates Homopolymers
C08F136/00 - C08F136/22	Rubbers Homopolymers
C08F138/00 - C08F138/04	Acetylenes Homopolymers
C08F210/00 - C08F210/18	Polyolefins Copolymers
C08F212/00 - C08F212/36	PS Copolymers
C08F214/00 - C08F214/287	Halogens Copolymers
C08F216/00 - C08F218/245	PVOH, PVOAc Copolymers
C08F220/00 - C08F234/04	Acrylates Copolymers
C08F236/00 - C08F236/22	Rubbers Copolymers
C08F238/00 - C08F238/04	Acetylenes Copolymers
C08F240/00 - C08F246/00	oils, drying oils coumarone
C08F251/00 - C08F292/00	Grafts
C08F293/00-C08F299/08	Blocks and interreacted polymers
C08F301/00 - C08F301/00	unspecified Copo
C08F2216/00 - C08F2218/245	PVOH, PVOAc (Additional monomers)
C08F2220/00 - C08F2234/04	Acrylates (Additional monomers)
C08F2400/00 - C08F2810/50	Additional indexing features

Organisation in C08F:

Processes

Homopolymers and copolymers
=> starts with C08F16
(C08FXX)

Homopolymers only
=> starts with C08F116
(C08F1XX)

Copolymers only
=> starts with C08F216
(C08F2XX)

– **Breakdown Codes 2XXX**

Parts	Topic
C08F2/00 - C08F2/60	Process
C08F4/00 - C08F4/58	Catalysts
C08F4/60 - C08F4/82	Transition Metal Cata
C08F6/00 - C08F6/28	Post treatments
C08F8/00 - C08F8/50	Post Modification
C08F10/00 - C08F10/14	Polyolefins Homo and Copolymers
C08F12/00 - C08F12/36	PS Homo and Copolymers
C08F14/00 - C08F14/28	Halogens Homo and Copolymers
C08F16/00 - C08F18/24	PVOH, PVOAc Homo and Copolymers
C08F20/00 - C08F34/04	Acrylates Homo and Copolymers
C08F36/00 - C08F36/22	Rubbers Homo and Copolymers
C08F38/00 - C08F38/04	Acetylenes Homo and Copolymers
C08F110/00 - C08F110/14	Polyolefins Homopolymers
C08F112/00 - C08F112/36	PS Homopolymers
C08F114/00 - C08F114/28	Halogens Homopolymers
C08F116/00 - C08F118/18	PVOH, PVOAc Homopolymers
C08F120/00 - C08F134/04	Acrylates Homopolymers
C08F136/00 - C08F136/22	Rubbers Homopolymers
C08F138/00 - C08F138/04	Acetylenes Homopolymers
C08F210/00 - C08F210/18	Polyolefins Copolymers
C08F212/00 - C08F212/36	PS Copolymers
C08F214/00 - C08F214/287	Halogens Copolymers
C08F216/00 - C08F218/245	PVOH, PVOAc Copolymers
C08F220/00 - C08F234/04	Acrylates Copolymers
C08F236/00 - C08F236/22	Rubbers Copolymers
C08F238/00 - C08F238/04	Acetylenes Copolymers
C08F240/00 - C08F246/00	oils, drying oils coumarone
C08F251/00 - C08F292/00	Grafts
C08F293/00-C08F299/08	Blocks and interreacted polymers
C08F301/00 - C08F301/00	unspecified Copo
C08F2216/00 - C08F2218/245	PVOH, PVOAc (Additional monomers)
C08F2220/00 - C08F2234/04	Acrylates (Additional monomers)
C08F2400/00 - C08F2810/50	Additional indexing features

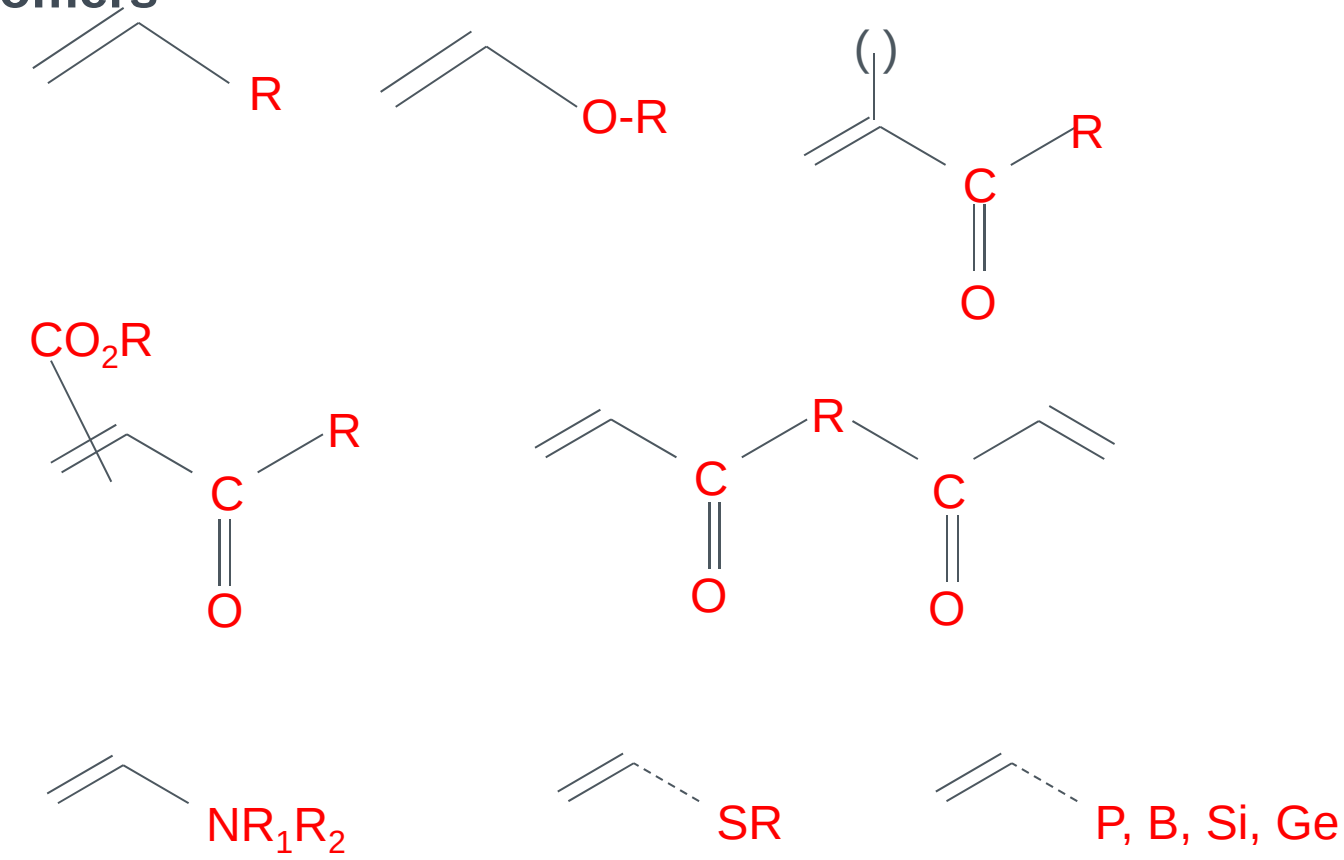
Breakdown codes: 2000-Codes in CPC

- 2000-codes come from the conversion of a previously used codification of monomers present in minority and coded for additional information (previous orthogonal ICO codes M08F).
- Said codification had more entries than the C08F trunk (deeper indexing, more sub-groups) than the C08F trunk.

For example:

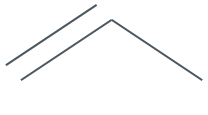
- C08F 220/10 . . Esters
- C08F 220/12 . . . of monohydric alcohols or phenols
- C08F 220/14 . . . . Methyl esters
- C08F 220/16 . . . . of phenols or of alcohols containing two or more carbon atoms
- C08F 220/18 . . . . . with acrylic or methacrylic acids
- C08F 2220/1808 . . . . . Ethyl or undefined short-chain (meth)acrylate
- C08F 2220/1816 . . . . . Propyl(meth)acrylate
- C08F 2220/1825 . . . . . Butyl(meth)acrylate
- C08F 2220/1833 . . . . . Pentyl or undefined long chain (meth)acrylate
- C08F 2220/1841 . . . . . Hexyl(meth)acrylate
- C08F 2220/185 . . . . . Heptyl(meth)acrylate
- C08F 2220/1858 . . . . . (iso)Octyl(meth)acrylate
- etc...

Organisation of the groups in C08F: based on chemical structure of the substituents on the double bond of the monomers



listed according to the nature of the substituent(s) present on the double bond in an order such as: R= H, C, X, O, CO2, (CO)N, N, P

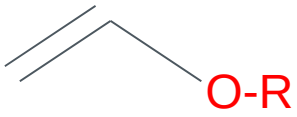
Polyolefins, Styrenics, Vinyl Halides



for example polyolefins

- **C08F210/00 alkenes (ethylene, propylene...): R= H; Alk**
- **C08F212/00 styrenics: R= Phenyl**
- **C08F214/00 vinyl halides: R=Cl, F...**

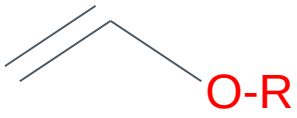
Vinyl alcohols, ethers and esters



- C08F216/00 vinyl alcohols and ethers thereof, leading to polyvinyl alcohols, polyvinyl ethers (R= H, Alk..)

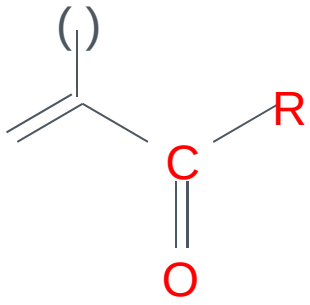
- C08F218/00 vinyl esters (e.g. leading to polyvinyl acetates) (R= (C=O)-Alk)

Vinyl alcohols, ethers and esters



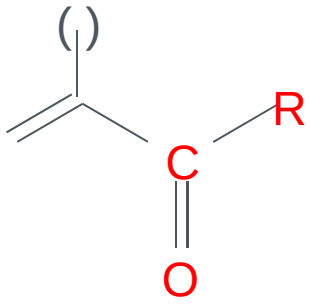
C08F 216/00	**Vinyl Alcohols, vinyl ethers**
C08F 216/02	. by an alcohol radical
C08F 216/04	. . Acyclic compounds
C08F 216/06	**. . . Polyvinyl alcohol; { Vinyl alcohol }**
C08F 216/08	**. . . Allyl alcohol**
C08F 2216/085	. . . . Allyl alcohol alkoxylate
C08F 216/10	. . Carbocyclic compounds
C08F 216/12	. by an ether radical
C08F 216/125	. . { monomers containing two or more unsaturated aliphatic radicals }
C08F 216/14	. . Monomers containing only one unsaturated aliphatic radical
C08F 216/1408	. . . { Monomers containing halogen }
C08F 216/1416	. . . { Monomers containing oxygen in addition to the ether oxygen }
C08F 2216/1425	. . . . Monomers containing side chains of polyether groups
C08F 2216/1433	. . . . . Monomers containing side chains of polyethyleneoxide groups
C08F 2216/1441	. . . . . Monomers containing side chains of polypropyleneoxide groups
C08F 2216/145	. . . . . Monomers containing side chains of polyethylene-co-propyleneoxide groups
C08F 216/1458	. . . { Monomers containing nitrogen }
C08F 216/1466	. . . { Monomers containing sulfur }
C08F 2216/1475	. . . . Monomers containing sulfur and oxygen
C08F 2216/1483	. . . . Monomers containing sulfur and nitrogen
C08F 2216/1491	. . . . Monomers containing sulfur, oxygen and nitrogen
C08F 216/16	. . Monomers containing no hetero atoms other than the ether oxygen
C08F 216/165	. . . . { Carbocyclic compounds }
C08F 216/18	. . . . Acyclic compounds
C08F 216/20	. . . . . Monomers containing three or more carbon atoms in the unsaturated aliphatic radical
C08F 216/34	. by an aldehydo radical
C08F 216/36	. by a ketonic radical
C08F 216/38	. by an acetal or ketal radical
C08F 218/00	**Vinyl esters**
C08F 218/02	. Esters of monocarboxylic acids
C08F 218/04	. . Vinyl esters
C08F 218/06	. . . Vinyl formate
C08F 218/08	**. . . Vinyl acetate**
C08F 218/10	. . . of monocarboxylic acids containing three or more carbon atoms
C08F 218/12	. . with unsaturated alcohols containing three or more carbon atoms
C08F 218/14	. Esters of polycarboxylic acids
C08F 218/16	. . with alcohols containing three or more carbon atoms
C08F 218/18	**. . . Diallyl phtalate**
C08F 2218/20	. Esters containing halogen
C08F 2218/22	. Esters containing nitrogen
C08F 2218/24	. Esters of carbonic or haloformic acids
C08F 2218/245	. . Esters of carbonic or haloformic acids, e.g. allyl carbonate

(Meth)acrylic acid, esters, amides, nitriles



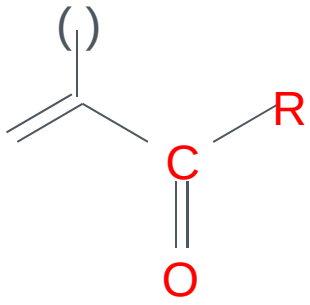
- **C08F220/00 Acrylic and methacrylic acid, esters, nitriles or amides , see table (R= OH, OAlk, NRR', CN...)**

(Meth)acrylic acid, esters, amides, nitriles



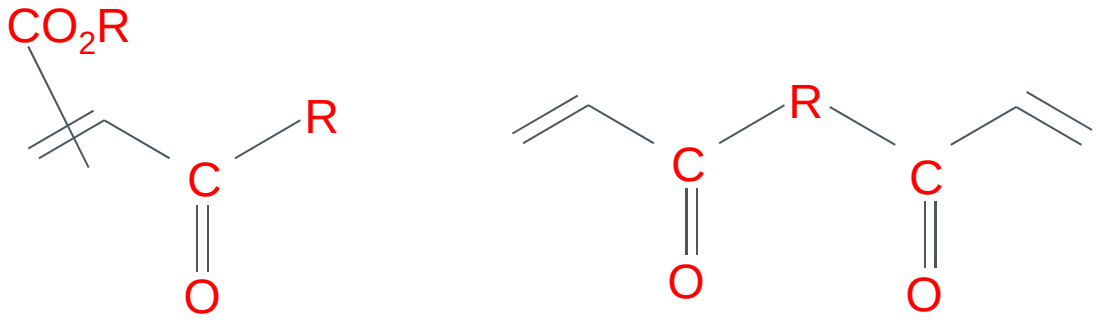
C08F220/02	. Monocarboxylic acids having less than ten carbon atoms; Derivatives thereof
C08F220/04	. . Acids; Metal salts or ammonium salts thereof
C08F220/06	**. . . Acrylic acid; Methacrylic acid; Metal salts or ammonium salts thereof**
C08F220/08	. . Anhydrides
C08F220/10	**. . Esters**
C08F220/12	. . . of monohydric alcohols or phenols
C08F220/14	. . . . Methyl esters **MMA**
C08F220/16	. . . . of phenols or of alcohols containing two or more carbon atoms
C08F220/18	**. . . . with acrylic or methacrylic acids**
C08F2220/1808	. . . . . Ethyl(meth)acrylate
C08F2220/1816	. . . . . Propyl(meth)acrylate
C08F2220/1825	. . . . . Butyl(meth)acrylate
C08F2220/1833	. . . . . Pentyl(meth)acrylate
C08F2220/1841	. . . . . Hexyl(meth)acrylate , phenyl (meth)acrylate
C08F2220/185	. . . . . Heptyl(meth)acrylate, benzyl (metha)crylate
C08F2220/1858	. . . . . (iso)Octyl(meth)acrylate ,2-ethylhexyl(meth)acrylate
C08F2220/1866	. . . . . C9-(meth)Acrylate
C08F2220/1875	. . . . . (iso)Decyl(meth)acrylate, isobornyl(meth)acrylate
C08F2220/1883	. . . . . Lauryl(meth)acrylate
C08F2220/1891	. . . . . Longer chain (meth)acrylate
C08F220/20	**. . . of polyhydric alcohols or phenols 2-hydroxyethyl (meth)acrylate, hydroxypropyl (meth)acrylate, glycerol(meth)acrylate**
C08F220/22	. . . Esters containing halogen
C08F220/24	. . . . containing perhaloalkyl radicals **PFA(Meth)Acrylates**
C08F220/26	. . . Esters containing oxygen in addition to the carboxy oxygen
C08F220/28	**. . . . containing no aromatic rings in the alcohol moiety**
C08F2220/281	. . . . . and containing only one oxygen, 2-methoxyethyl(meth)acrylate
C08F2220/282	. . . . . and containing two or more oxygen atoms
C08F2220/283	. . . . . and containing one or more carboxylic moiety in the chain **Acetoacetyl-(meth)acrylate**
C08F2220/285	. . . . . and containing an ether chain in the alcohol moiety
C08F2220/286	. . . . . and containing polyethylenoxide in the alcohol moiety **PEGMA**
C08F2220/287	. . . . . and containing polypropylenoxide in the alcohol moiety
C08F2220/288	. . . . . and containing polypropylen-co-ethylen oxide in the alcohol moiety
C08F220/30	**. . . . containing aromatic rings in the alcohol moiety**
C08F2220/301	. . . . . and one oxygen in the alcohol moiety
C08F2220/302	. . . . . and two or more oxygen atoms in the alcohol moiety
C08F2220/303	. . . . . and one or more carboxylic moieties in the chain
C08F2220/305	. . . . . and ether chain in the alcohol moiety
C08F2220/306	. . . . . and polythylenoxide chain in the alcohol moiety
C08F2220/307	. . . . . and polypropylene oxide chain in the alcohol moiety
C08F2220/308	. . . . . and polyethylene-co-propylene oxide chain in the alcohol moiety
C08F220/32	. . . . containing epoxy radicals
C08F2220/325	**. . . . . containing glycidyl radical GMA: glycidyl methacrylate**

(Meth)acrylic acid, esters, amides, nitriles



C08F220/34 **. . . Esters containing nitrogen, N,N-dimethylaminoethyl(meth)acrylate**
C08F2220/343 . . . . in the form of urethane links
C08F2220/346 . . . . . and further oxygen
C08F220/36 . . . . containing oxygen in addition to the carboxy oxygen, 2-N-morpholinoethyl (meth)acrylate or 2-isocyanatoethyl(meth)acrylate
C08F2220/365 . . . . . containing further carboxylic moieties
C08F220/38 **. . . Esters containing sulfur**
C08F2220/382 . . . . and containing oxygen, 2-sulfoethyl(meth)acrylate
C08F2220/385 . . . . and containing nitrogen
C08F2220/387 . . . . and containing nitrogen and oxygen
C08F220/40 . . . Esters of unsaturated alcohols **Allyl Acrylate**
C08F220/42 . . Nitriles
C08F220/44 **. . . Acrylonitrile**
C08F220/46 . . . . with carboxylic acids, sulfonic acids or salts thereof
C08F220/48 . . . . with nitrogen-containing monomers
C08F220/50 . . . containing four or more carbon atoms
C08F220/52 . . Amides or imides
C08F220/54 . . . Amides , N,N-dimethylacrylamide or N-isopropylacrylamide
C08F220/56 **. . . . Acrylamide; Methacrylamide**
C08F220/58 . . . . containing oxygen in addition to the carbonamido oxygen **N-Methylol AA, N-acryloyl morpholine**
C08F2220/585 . . . . . and containing other heteroatoms **AMPS**
C08F220/60 . . . . containing nitrogen in addition to the carbonamido nitrogen
C08F2220/603 . . . . . and containing oxygen in addition to the carbonamido oxygen and nitrogen
C08F2220/606
C08F220/62 **. Monocarboxylic acids having ten or more carbon atoms; Derivatives thereof**
C08F220/64 . . Acids; Metal salts or ammonium salts thereof
C08F220/66 . . Anhydrides
C08F220/68 . . Esters
C08F220/70 . . Nitriles; Amides; Imides

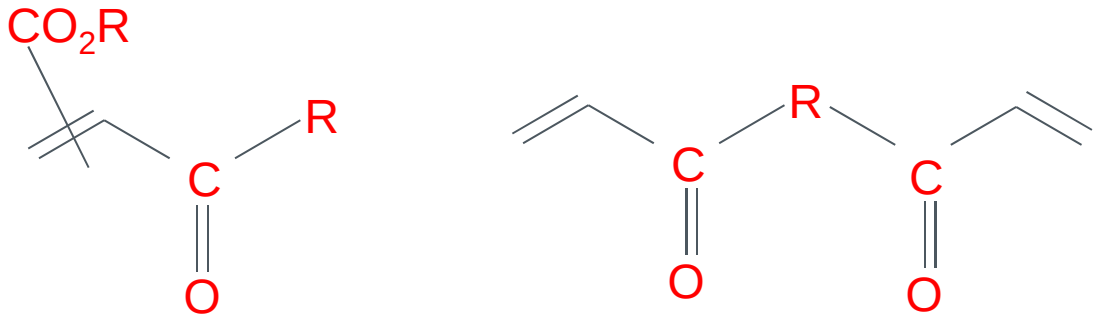
Maleates and di- or polyfunctionals



- **C08F 222/00 Copolymers of compounds having one or more unsaturated aliphatic radicals each having only one carbon-to-carbon double bond, at least one being terminated by a carboxyl radical and containing at least one other other carboxyl radical in the molecule; Salts, anhydrides, esters, amides, imides or nitriles thereof**

- **Maleic anhydride, maleic acids, esters, diallyl maleate, nitriles, imides thereof**
- **Esters of polyhydric alcohols: ethylene glycol dimethacrylate...(C08F222/1006)**

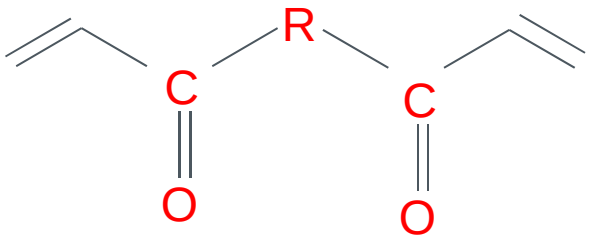
Maleates and di- or polyfunctionals

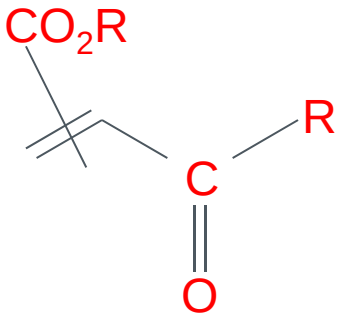


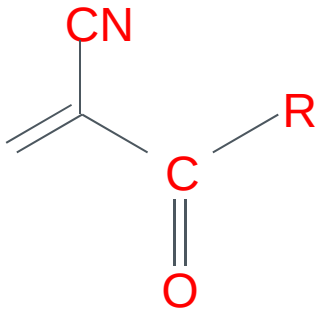
– **C08F 222/00 Copolymers of compounds having one or more unsaturated aliphatic radicals each having only one carbon-to-carbon double bond, at least one being terminated by a carboxyl radical and containing at least one other other carboxyl radical in the molecule; Salts, anhydrides, esters, amides, imides or nitriles thereof**

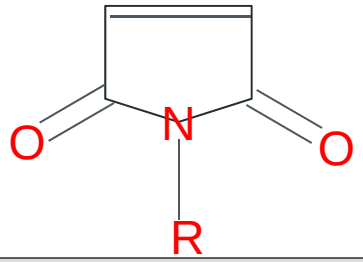
C08F 222/00
C08F 222/02 . Acids; Metal salts or ammonium salts thereof: maleic acid, itaconic acid...
C08F 222/04 . Anhydrides, e.g. cyclic anhydrides
C08F 222/06 . . Maleic anhydride
C08F 222/08 . . . with vinyl aromatic monomers maleic/styrene

Maleates and di- or polyfunctionals





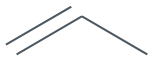




C08F 222/10	**. Esters**
C08F 222/1006	. . of polyhydric alcohols
C08F 2222/1013	. . . of dialcohols: Ethylene glycol di(meth)acrylate, 1,4-butanediol dimethacrylate
C08F 2222/102	. . . . of aromatic dialcohols
C08F 2222/1026	. . . of trialcohols Trimethylolpropane tri(meth)acrylate
C08F 2222/1033	. . . . of aromatic trialcohols
C08F 2222/104	. . . of tetraalcohols: Pentaerythritol tetra(meth)acrylate
C08F 2222/1046	. . . . of aromatic tetraalcohols
C08F 2222/1053	. . . of pentaalcohols
C08F 2222/106	. . . . of aromatic pentaalcohols
C08F 2222/1066	. . . Esters of polycondensation macromers
C08F 2222/1073	. . . . of alcohol terminated polyesters or polycarbonates acrylic polyesters
C08F 2222/108	. . . . of alcohol terminated polyethers
C08F 2222/1086	. . . . of alcohol terminated (poly)urethanes urethane (meth) acrylates
C08F 2222/1093	. . . . of alcohol terminated epoxy functional polymers epoxy polyacrylates
C08F 222/12	. . of phenols or saturated alcohols
C08F 222/14	**. . . Esters having no free carboxylic acid groups: dialkyl maleate, fumarate, itaconate...**
C08F 2222/145	. . . . the ester chains containing seven or more carbon atoms
C08F 222/16	. . . Esters having free carboxylic acid groups: monoalkyl maleate, fumarate, itaconate...
C08F 2222/165	. . . . the ester chains containing seven or more carbon atoms
C08F 222/18	. . . Esters containing halogen
C08F 2222/185	. . . . the ester chains containing seven or more carbon atoms
C08F 222/20	. . . Esters containing oxygen in addition to the carboxy oxygen
C08F 2222/205	. . . . the ester chains containing seven or more carbon atoms
C08F 222/22	. . . Esters containing nitrogen
C08F 2222/225	. . . . the ester chains containing seven or more carbon atoms
C08F 222/24	. . . Esters containing sulfur
C08F 2222/245	. . . the ester chains containing seven or more carbon atoms
C08F 222/26	. of unsaturated alcohols
C08F 222/28	. . . Diallyl maleate
C08F 222/30	. Nitriles
C08F 222/32	. . alfa-Cyano-acrylic acid; Esters thereof
C08F 2222/321	. . . alfa-Cyano-acrylic acid methyl ester
C08F 2222/322	. . . alfa-Cyano-acrylic acid ethyl ester 2-ethylcyanoacrylate
C08F 2222/323	. . . alfa-Cyano-acrylic acid propyl ester
C08F 2222/324	. . . alfa-Cyano-acrylic acid butyl ester
C08F 2222/325	. . . alfa-Cyano-acrylic acid pentyl ester
C08F 2222/326	. . . alfa-Cyano-acrylic acid longer chain ester
C08F 2222/327	. . . alfa-Cyano-acrylic acid alkoxy ester
C08F 2222/328	. . . alfa-Cyano-acrylic acid with more than one oxygen in the ester moiety
C08F 222/34	. . Vinylidene cyanide
C08F 222/36	. Amides or imides
C08F 222/38	. . Amides
C08F 222/385	
C08F 222/40	. . Imides, e.g. cyclic imides
C08F 2222/402	. . . Alkyl substituted imides
C08F 2222/404	. . . the substituted imides comprising oxygen other than the carboxy oxygen
C08F 2222/406	. . . the substituted imides comprising nitrogen other than the imide nitrogen
C08F 2222/408	. . . the substituted imides comprising other heteroatom

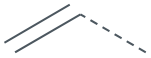
Heterosubstituted...

- C08F 224/0 containing hetetrocyclic ring containing oxygen (not acrylates)



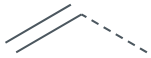
NR_1R_2

- C08F 226/00



SR

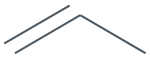
- C08F 228/00



P, B, Si, Ge

- C08F 230/00

Heterosubstituted...



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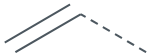
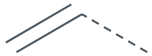


SR



P, B, Si, Ge

– **C08F 226/00** – **C08F 228/00** – **C08F 230/00**

C08F224/00 **terminated by a heterocyclic ring containing oxygen**

C08F226/00 **terminated by a single or double bond to nitrogen or by a heterocyclic ring containing nitrogen**

C08F 226/02 . by a single or double bond to nitrogen
C08F 226/04 . . Diallylamine
C08F 226/06 . by a heterocyclic ring containing nitrogen N-vinyl pyridine, N-vinyl imidazole
C08F 226/08 . . N-Vinyl-pyrrolidine
C08F 226/10 . . N-Vinyl-pyrrolidone
C08F 226/12 . . N-Vinylcarbazole

C08F 228/00 **terminated by a bond to sulfur or by a heterocyclic ring containing sulfur**
C08F 228/02 . by a bond to sulfur
C08F 228/04 . . Thioethers
C08F 228/06 . by a heterocyclic ring containing sulfur

C08F230/00 **conatining metal**
C08F 230/02 . containing phosphorus
C08F 230/04 . containing a metal
C08F 230/06 . . containing boron
C08F 2230/065 . . . the monomer being a polymerisable additive
C08F 230/08
C08F 2230/085 . . . the monomer being a polymerisable additive, (meth)acryloyloxy trialkoxy silanes or vinyl trialkoxysilanes
C08F230/10 . . containing germanium

- C08F232/00 unsaturated carbocyclic ring
- C08F234/00 unsaturated heterocycles
- C08F236/00: dienes
- C08F238: acetylenes
- C08F240: copolymers of hydrocarbons and mineral oils
- C08F242/00: drying oils with other monomers
- C08F244/00: Coumarone-indene

Special rules of classification, see CPC-definition

Rule:

•*In a copolymer, the monomer in majority is given an Indexing Code*

• *and the monomer(s) in minority are given Indexing Code(s) in the form of a Combination Set. The Indexing Codes are linked.*

•*The monomer in majority is always indicated first in the Combination set.*

Example: a copolymer having MMA in majority and MAc in minority is classified in:

Single symbol invention: C08F220/14

Combination Set: C08F220/14, C08F220/06

In the Combination sets, it is the first symbol that determines whether the whole Combination set is INV(ention) or ADD(itional).

Main trunk vs 2000-codes in CPC, INV or ADD ?

Rule:

- *In a copolymer, the monomer in majority is given an Indexing Code*
- *and the monomer(s) in minority are given Indexing Code(s) in the form of a Combination Set. The Indexing Codes are linked.*
- *The monomer in majority is always indicated first in the Combination set.*

  - *The monomer in majority receives a Single Symbol /CI (INV), the monomers in minority an /CL (ADD) in the form of a Combination set*

  - In principle CPC allows using the whole CPC classification as INV or ADD
  - All C08F20,120,220 (main trunk) may be used as INV or ADD

  However:

  - C08F2220 can only be used as ADD
  - As the Combination sets is used to specify the co-monomers with highest precision, the whole scheme should be used (interleaved C08F200 and C08F2000) and the Combination set is given as ADD

Special rules of classification, see CPC-definition

Rule: *In a copolymer, the monomer in majority is given an Indexing Code and the monomer(s) in minority are given Indexing Code(s) in the form of a Combination Set. The Indexing Codes are linked. The monomer in majority is always indicated first in the Combination set.*

Example

A copolymer of

- **50 wt % Butyl acrylate**
- **30 wt % Methyl Methacrylate**
- **20wt % Acrylic acid**

Will receive a Combination set Additional: C08F2220/1825 , C08F220/14, C08F220/06 And as Single Symbol Invention: C08F220/18 (for (Butyl) acrylate, use the Main Group)

Classification in practice:

- The classes are given on the basis of the chemical structure of the monomers engaged in the polymerisation
- Give the lowest and more appropriate sub-group wrt chemical structure, do not use main-groups unless not otherwise possible

- We give Combination Sets only when the polymerisation or the structure of the copolymer is explicitly disclosed in the document, either in the general description or in the examples (not for hypothetic polymers or lists of possible monomers that may be used), seldom from claims.

- Ideally, we classify all examples, also when the examples are using co-monomers which are in different groups (e.g. ethylene-vinyl acetate, styrene-acrylates..)

- In the documents containing many examples, each comonomer used should appear in at least one Combination Set.

- We classify random copolymers, however graft and block are also considered, see below

- Pay attention to neighbouring fields epoxies, polyurethanes, coatings, adhesives, cosmetics

Grafts: C08F251/00 to C08F292/00: Base symbol on the basis of the backbone polymer in the graft

- C08F251/00: onto polysaccharides
- C08F253/00: onto natural rubbers
- C08F255/00: onto polymers of C08F10 (polyolefins)
- C08F257/00: onto polymers of C08F12 (Styrenics)
- C08F259/00: onto polymers of C08F14 (vinyl halides)
- C08F261/00: onto polymers of C08F16 (vinyl alcohols, ethers)
- C08F263/00: onto polymers of C08F18 (vinyl acetates, esters)
- C08F265/00: onto polymers of C08F20/00 (acrylics)
- C08F267/00: onto polymers of C08F22/00 (maleics..)
- C08F269/00-C08F281/00: onto polymers of C08F24/00 to C08F38/00
- C08F283/00: onto polymers of C08G
- C08F285/00: onto preformed graft polymers
- C08F287/00: onto Block copolymers
- C08F289/00: onto polymers not provided for in C08F251/00 to C08F284/00
- C08F290/00: onto polymers modified by introduction of aliphatic unsaturated end or side groups
- C08F291/00 onto polymers according to more than one of groups C08F251/00 to C08F289/00
- C08F292/00: onto inorganic materials

Grafts: C08F251/00 to C08F292/00

- **Special rules of classification within this group**
- In C08F251/00 to C08F292/00, the grafted monomer may be indicated using the subdivision of C08F210/00 to C08F238/04 in the form of a Combination Set:
- e.g. cellulose grafted with styrene will be classified in

  Combination Set C08F251/02, C08F212/08

- This specification of the grafted monomer is used when the monomer is specified in the claims or in the examples.
- If several monomers are grafted, the monomer in majority is indicated unless interesting information is present in a minor co-monomer, such as monomer bearing reactive functional group or if the monomer is a crosslinker, e.g. diacrylate, it is important to indicate it in a Combination Set.
- If the polymer to be grafted is a copolymer, the base symbol corresponding to the backbone component in majority is given.
- In cases of co-grafting, i.e. a monomer is reacted in the presence of two backbone polymers, both symbols related to the backbone are given.
- For example co-grafting of a monomer onto a polyethylene and a polysiloxane will be classified in C08F255/02 and C08F283/12 i.e. in two Combination sets,
- For core shell polymers, the order of addition is considered for classification. If a seed polymer is used, it is normally ignored for classification.

Grafts: C08F251/00 to C08F292/00

- **Special rules of classification within this group**

- Example: A core shell polymer obtained by:

1) polymerization of styrene into polystyrene

2) polymerization of acrylic acid in the presence of the polymer obtained in step 1)

Combination set: C08F257/02, C08F220/06

- Example: If the polymer to be grafted is a copolymer, the symbol corresponding to the backbone component in majority is given

1) ethylene/ acrylic acid (80/20) copolymer

2) grafted with MMA:

Combination set: C08F255/02, C08F220/14

- Long chain PEGMA is considered as a polymer (C08F290/062) , also, colloidal stabilisers such as PVOH (C08F261/04)

Most important neighbouring fields

- Compositions of polymers: C08L: Mixtures of two polymers in a composition
  - C08L29: Polyvinyl alcohols...
  - C08L31: Polyvinyl acetates...
  - C08L33: Poly(meth)acrylates...
  - C08L35: Maleates..
- Additives (C08K5/xx,C08L/xx)

- Applications or Uses:
  - Adhesives C09J1XX (XX: same numbers as C08L)
  - Coatings C09D1XX (XX: same numbers as C08L)
  - Foams, C08J...
  - These classes are given when the specific use of the polymer is disclosed in the document, the corresponding classes for the monomers (C08F216-222) are also given as additional information when the polymerisation is disclosed.
- C09D4/00, C09J4/00 (and /06)

Other fields where Acrylic polymers are used:

- Cosmetic compositions based on polyacrylic polymers:
  - A61K8/8152

  See also
  - A61Q5/00 (preparation for hair, hair treatment)
  - A61Q19/00 (preparation for skin, skin treatment)
  - A61K2800/548 (associative polymers)
- Superabsorbent: A61L15/60, A61F13/15
- Cement additives: C04B24/2641, /2647(comb acrylates)
- PSA. C09J7/0217 C09J2201/606 and /61 hot melt
- Flocculants for water treatment: C02F1/56
- Compositions for drilling of boreholes or well: C09K8/5083
- Detergent compositions: C11D3/37, /3757
- Binders for fibres: D06M15/21, D04H1/64
- Contact lenses: G02B1/04
- Fuel cell membranes H01M8/102, Electrolytes: H01M2300/0082
- Photoresists

Tips for search

- In acrylics, Combination sets have been given as from April 2012
- For earlier documents, no Combination sets were given
- Before 04/2012, second or further symbol(s) given as separate additional symbol(s)

- (Meth)acrylic acid, in principle in C08F220/06, in the past sometimes in C08F220/02 /04
- Hydroxy alkyl (meth)acrylates, in principle in C08F220/20, in the past also in C08F220/28xx
- Di-Poly-acrylates (EGDMA, TMPTA..) in the past systematically in M08F222/10b, now spited in C08F(2)222/10xx, search with C08F?222/10??
- Double bonds terminated by an O or N ctg heterocyclic compounds, in C08F224/00, C08F226/00, attn C08F220 takes precedence
- Silicium containing monomers: C08F230/08
- Now vinyl alkoxy silanes and acryloyloxy alkoxysilanes: C08F2230/085

Tips for search

- **Acrylic polyols** for 2K PU:
- Monomers may be in C08F220/20 or C08F220/28xxx (HEMA)
- Compositions may be in C08L33/xxx in principle C08L33/066
- If used as coating composition, may be in C09D133/xxx (/066) or in C09D175/00 or /04
- Remark: the polyol itself may also be in C08G18/62(25)... if classified by polyurethanes

- **Core-shell or multistep** processes may be in grafts: e.g C08F265/06
- Polymerisation using PEGMA may be in C08F290/062
- Remark: compositions thereof in C08L51/00

EXAMPLE

US2011/0247746 Acrylic dispersions: Polymerisation and adhesives

(19) **United States**

(12) **Patent Application Publication**

SCHUMACHER et al.

(10) **Pub. No.: US 2011/0247746 A1**

(43) **Pub. Date: Oct. 13, 2011**

(54) **USE OF SYNTHETIC ADHESIVES IN THE MANUFACTURE OF CORRUGATED FIBERBOARD**

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(73) Assignee: **BASF SE**, Ludwigshafen (DE)

(21) Appl. No.: **13/083,028**

(22) Filed: **Apr. 8, 2011**

Related U.S. Application Data

(60) Provisional application No. 61/322,317, filed on Apr. 9, 2010.

Publication Classification

(51) **Int. Cl.**

B31F 1/20 (2006.01)

B32B 37/12 (2006.01)

(52) **U.S. Cl.** **156/210**; 156/332

(57) **ABSTRACT**

Described is the use of synthetic adhesives in the manufacture of corrugated fiberboard at relatively low temperatures and high lineal speeds. The corrugated fiberboard includes a corrugated sheet of paper and a flat linerboard and the corrugation of the corrugated sheet of paper is produced at paper temperatures below 95° C. and at a lineal speed above 150 m/min. The production of the corrugation of a corrugated sheet of paper is immediately followed by a continuous operation in which a preferably unheated corrugated board adhesive is applied and the corrugated sheet of paper is adhered to at least one first linerboard. The corrugated board adhesive used is an aqueous adhesive dispersion based on at least one synthetic, dispersed polymer having preferably more than 40% by weight solids content, selected from acrylate copolymers, copolymers of vinylaromatics and conjugated aliphatic dienes and vinyl acetate-alkylene copolymers, wherein the glass transition temperatures of the polymers are above 20° C. and (preferably at least 5° C.) below the surface temperature of the corrugated sheet of paper to which they are applied.

US2011/0247746 Acrylic dispersions: Polymerisation and adhesives

Inventive Example 1

[0059] Copolymer formed from 39.5 parts by weight of n-butyl acrylate, 56.5 parts by weight of styrene, 4 parts by weight of methacrylic acid, emulsion polymerized in water in the presence of 0.1 part by weight of tert-dodecyl mercaptan, 1.2 parts by weight of Disponil® FES 27 emulsifier, 0.25 part by weight of Dowfax 2A1 emulsifier, 0.6 part by weight of sodium persulfate (initiator).

[0060] Solids content: 49%, pH 6.2, Tg +41° C.

Styrene, n-Butyl acrylate, Methacrylic acid

Combination Set: C08F212/08, C08F2220/1825, C08F220/06

Inventive Example 3

[0063] Copolymer formed from 38 parts by weight of n-butyl acrylate, 55 parts by weight of styrene, 5 parts by weight of vinyl acetates, 2 parts by weight of acrylic acid, emulsion polymerized in water in the presence of 0.1 part by weight of tert-dodecyl mercaptan, 1.2 parts by weight of Disponil® FES 27 emulsifier, 0.25 part by weight of Dowfax 2A1 emulsifier, 0.6 part by weight of sodium persulfate (initiator).

[0064] Solids content: 49%. pH 4.0. Tg +35° C.

Styrene, n-Butyl acrylate, Vinyl acetate, Methacrylic acid

Combination Set: C08F212/08, C08F2220/1825, C08F218/08, C08F220/06

Inventive Example 10

[0077] Copolymer formed from 56.5 parts by weight of styrene, 32.0 parts by weight of butadiene, 11 parts by weight of acrylic acid; 0.5 part by weight of itaconic acid, emulsion polymerized in water in the presence of 1.1 parts by weight of tert-dodecyl mercaptan, 0.5 part by weight of Lumiten I-SC, 0.9 part by weight of sodium persulfate.

[0078] Solids content: 52%, pH 5.6, Tg +26.3° C.

Styrene, Butadiene, Methacrylic acid, Itaconic acid

Single Symbol: C08F212/08

Combination Set: C08F212/08, C08F236/10, C08F220/06,C08F222/02