

This heading is primarily concerned with:

- . the choice of reactive materials to undergo reaction with pre-formed addition polymers
- . the choice of reaction conditions to effect chemical after treatment of pre-formed addition polymers subject to the explanation set out below

Explanation of heading subject matter and relationships with other headings

This heading is restricted to documents that would be found in headings C3E, India rubber &c, and C3P, Addition Polymers &c as defined in the 1500001 Key. Chemical after-treatment of other types of polymer is therefore subject matter for the headings dealing with the polymer *per se* - see such headings as C3A, Cellulose derivatives &c; C3B, Epoxy resins; C3H, Proteins, enzymes and nucleic acids; C3R, Condensation polymers &c; C3T, Organo-silicon polymers; C3U, Polysaccharides &c.

Classified here are disclosures concerned with the various chemical after treatments, listed in the Classifying Schedule, of addition polymers

Polymer compositions comprising blends of a polymer with small quantities of monomeric cross-linking agent are subject-matter for this heading. Compositions containing substantial quantities of monomeric agents are handled in C3V, Miscellaneous polymer compositions, articles and uses. Disclosures concerned with the coupling and polymerising of saturated monomers on a polymer base are classified here and not in C3P, Addition polymers &c

Chemical treatments of the surface of addition polymers are recorded in heading C3L, Polymer &c working up. However if the chemical reaction concerned is novel or unusual it is also recorded in this heading

Excluded are:

- . processes for cross-linking polymers containing epoxy groups by opening the epoxy rings—C3B, Epoxy resins
- . protein-polymer and enzyme-polymer reaction products—C3H, Proteins, enzymes and nucleic acids
- . compositions based on or containing chemically modified polymers—C3K, Polymer &c additives; C3M, Polymer &c blends; C3V, Miscellaneous polymer compositions, articles and uses
- . methods of incorporating reactants in polymers and of further manipulating chemically after treated polymers, *eg*, purifying or recovering from solutions—C3L Polymer &c working up
- . formation of polyurethanes and like condensation polymers using polybutadienediol and like reactants—C3R Condensation polymers &c
- . “overbased” polymer salts—C4X, Miscellaneous compositions and materials

The exclusion references listed in this heading are not exhaustive. Reference should be made to the appropriate general heading/s for processes, materials, elements or devices which may be more widely applicable than can appropriately be classified in this heading

Relationship with the Universal Indexing Schedules (heading U1S)

In addition to recording uses and applications of inventions classified in this heading, U1S is used, subject to its indexing rules, to record significant properties of materials with which this heading is concerned, in so far as this information is not inherent in the classifying terms assigned

Operative date for Key entries

The operative date of the terms in this heading is that of Edition A

Classifying, indexing and searching notes

1. The reactions which polymers undergo have been notionally divided into two categories depending to a large extent on the manner in which the information concerning the reactions and reaction products is presented in documents. Thus one category is for reactions generally described by the effect intended (terms JAA—JAX) and the other for reactions generally described in terms of the group or atom on the polymer that reacts (terms JCA—JDX). The description of these two categories is not rigorous; for example, one common reaction of polymers containing hydroxyl groups is esterification, but is found in the second category (JCU). Since these terms are classifying terms, a value judgment may be necessary when assigning a single reaction to the classifying schedule. It therefore follows that in certain cases search for a single reaction may be necessary in two places. This is especially true for reactions involving “cross-linking”
2. Reactions occurring simultaneously or consecutively, and reactions between complementary functional groups on a single polymer or on two or more different polymers, are regarded as different reactions
3. Information relating to the nature of the polymeric starting material with which an invention is concerned is recorded by assigning terms from Indexing Schedule C3W. Full information on indexing practice is given in the schedule

Classifying schedule and associated Indexing Schedules**JAA**
JAB

preventing premature cross-linking, curing or vulcanising by the use of chemical retarders
 cross-linking, curing or vulcanising processes characterised by the materials used
. cross-linking by reaction of well-defined functional groups with complementary compounds is classified under the appropriate term for reactions involving said functional group

Associated Indexing Schedule for term JAB

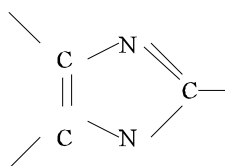
This schedule provides terms to identify those materials (*other than the starting polymer*) which take part in the cross-linking, curing or vulcanising process, or which initiate or accelerate it. Other materials present, *eg* fillers and solvents, are not recorded. An additional term (J300) is provided for the use of energy to assist the process

Ethylenically unsaturated monomers, photosensitisers and photosensitive cross-linking agents are indexed only under the terms specifically provided for such materials, and the presence of zinc oxide, zinc stearate, stearic acid and conventional forms of sulphur in sulphur-type vulcanising systems is not recorded

ethylenically unsaturated monomers—

- J100 . containing nitrogen
 J102 . containing silicon
 J104 . not containing nitrogen or silicon
 J106 . mono-unsaturated
 J108 . di- or poly-unsaturated
 J110 photosensitisers and photosensitive cross-linking agents
 J120 sulphur
 J122 water
 J124 metal oxides and hydroxides
 J126 other elements and inorganic compounds
 J130 organic compounds containing phosphorus
 organic compounds containing sulphur—

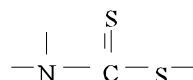
- J140 . containing the structure



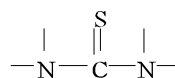
- J142 . containing the structure



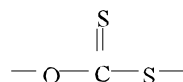
- J144 . containing the structure



- J146 . containing the structure



- J148 . containing the structure



- J150 . other organic sulphur compounds
 organic compounds containing nitrogen but not sulphur or phosphorus—
 J160 . containing nitroso groups
 J162 . containing amine groups
 J164 . containing quaternary ammonium groups
 J166 . containing other N-containing groups
 J170 organic compounds containing a peroxy group
 J172 organic compounds containing a metal atom but not sulphur
 J174 organic compounds containing aromatic hydroxy groups
 J180 macromolecules
 J190 organic compounds not provided for above
 J300 assisting cure by means of energy (*other than mere heat*)

Classifying Schedule—*cont*

JAC cross-linking, curing or vulcanising processes characterised by procedures or apparatus

Associated Indexing Schedule for term JAC

J350 . processes and apparatus for curing long lengths of polymer, *eg* cable coverings
 J352 . multi-stage curing processes
 J354 . processes using special energy sources, *eg* electromagnetic radiation
 J356 . special method of use of conventional curing agent(s)
 J358 . use of flexible wrappings
 J360 . use of fluid baths or fluidised beds
 J362 . other special apparatus
 J364 . processes not otherwise provided for above

JAD dehalogenation and dehydrohalogenation

JAE depolymerisation, peptization, pyrolysis, thermal decomposition

JAF haloalkylation

JAG halogenation and hydrohalogenation, *ie* reaction to introduce halogen or halogen and hydrogen atoms only into the polymer

JAH hydrogenation and reduction

JAJ hydrolysis and alcoholysis

Associated Indexing Schedule for term JAJ

. reaction medium containing—
 J400 . . water
 J402 . . an alcohol
 J404 . . a hydrocarbon solvent
 J406 . . an acidic catalyst
 J408 . . a basic catalyst
 J410 . two or more reaction stages
 J412 . special apparatus used
 J414 . other special procedural details

JAK oxidation and ozonisation

JAL phosphosulphurisation

JAM sulphohalogenation

JAN sulphonation

JAP chemical dyeing (processes are not classified elsewhere for the reactions involved)

JAQ nitration

JAR increasing molecular weight (*other than* by reactions involving well-defined functional groups)

JAS formation of resin-drug reaction products or complexes

JAT formation of polymer complexes (*other than* with drugs)

JAU joining together molecules of two different polymers (*other than* by reactions between functional groups)

JAV lactonisation

JAW rearrangement, including isomerization and cyclization

JAX other reactions described by the effect intended

Classifying Schedule—*cont*

- reactions described in terms of the reactive group or atom on the polymer—
- JCA** . acetylenic or ethylenic groups, addition of reactant to
 . . halogenation, hydrogenation. *See* terms JAG and JAH *above*
- JCB** . aldehyde groups and keto groups
- JCC** . amide groups (*including* substituted amide groups)
 . amino groups—
- JCD** . . with aldehyde or keto groups
- JCE** . . with other groups
 . carboxylic acid, anhydride and carboxylate salt groups—
 . . with bases (*eg.* amines, alkalis)—
 . . . formation of amides and imides
- JCF** . . . formation of aminoesters by reaction with alkyleneimines
- JCG** . . . other reactions
- JCH** . . . *Practice notes:*
 1. *salt formation which is a distinct reaction is classified here. Salt formation which is not a distinct reaction (eg, the addition of an alkali to increase the pH above 7) is not recorded*
 2. *The assignment of documents to JCF or JCH may be arbitrary, in the sense that full information as to the reaction product may not be given. However, if the reaction of a carboxyl group with an amine gives rise to a water-soluble product, the reaction is almost certainly classified under JCH*
- JCJ** . . with hydroxyl groups
- JCK** . . with oxirane and thiirane groups
- JCL** . . with other groups
- JCM** . cyano groups
 . epoxy groups. *See* term JDB *below*
- JCN** . ether groups
- JCP** . groups containing metal-carbon bonds
- JCQ** . groups containing phosphorus
- JCR** . halogen atoms
- JCS** . hydrogen atoms
 . . replacement of hydrogen by halogen or haloalkyl. *See* terms JAF and JAG *above*
 . hydroxyl groups—
- JCT** . . with aldehyde or keto groups
- JCU** . . with carboxylic, carboxylic anhydride or carbonyl halide groups
- JCV** . . with isocyanate groups
- JCW** . . with other groups
- JCY** . isocyanate groups
- JDA** . mercapto groups
- JDB** . oxirane groups
- JDC** . peroxide and hydroperoxide groups
- JDD** . sulphonic acid, sulphonate and sulphonyl halide groups
- JDE** . carbonyl halide groups
- JDF** . carboxylic acid ester groups
- JDX** . other groups and atoms