



Standard Practice for Dissolving Polymer Materials¹

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1. Scope*

1.1 This practice outlines the parameters applicable to the preparation of a polymeric solution, such as solvent, concentration, temperature, pressure, time, agitation, and heating mode.

1.2 The proper use of this practice requires a knowledge of solvents and their effect on polymeric materials.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—There is no equivalent ISO standard.

2. Referenced Documents

2.1 *ASTM Standards:*²

D 883 Terminology Relating to Plastics

D 1600 Terminology for Abbreviated Terms Relating to Plastics

2.2 *Other Document:*

Polymer Handbook³

3. Terminology

3.1 Definitions are in accordance with Terminology D 883.

3.2 Abbreviations are in accordance with Terminology D 1600.

4. Summary of Practice

4.1 A polymer solution can be described or prepared using the cell classifications listing the parameters relative to solvate the polymer. The cell classifications are listed in the following order: polymer, solvent, concentration, temperature, time, container, heating mode, and agitation.

4.1.1 A polymer and a list of suggested solvents for making a solution are listed in Annex A1.

4.1.2 Table 1 designates the parameters for container, heating mode, and type of agitation.

NOTE 2—To illustrate the use of the cell classifications with Table 1, a 2 % solution of poly(vinyl chloride) using cyclohexanone would be written as:

PVC–cyclohexanone–20–66–40–BEC

where:

PVC	= the abbreviation of the polymer from Annex A1,
cyclohexanone	= the solvent from Annex A1,
20	= the weight of polymer in tenths of a percent,
66	= the temperature in degrees Celsius,
40	= the time in tenths of an hour,
B	= glass container from Table 1,
E	= bath heater from Table 1, and
C	= random agitation from Table 1.

5. Significance and Use

5.1 This practice embodies the specifications to describe the preparation of a polymeric solution.

6. Procedure

6.1 *Polymer*—Select the applicable polymer from Annex A1 and write its abbreviation.

6.2 *Solvent*—Select the solvent applicable to the polymer from Annex A1.

6.3 *Concentration*—Write the polymer gram weight in tenths of a percent per milliliter of solvent.

6.4 *Temperature*—Write the solution temperature in degrees Celsius.

6.5 *Time*—Write the time for solution in tenths of an hour.

6.6 *Container*—Select the type of container from Table 1.

6.7 *Heating Mode*—Select the heating mode from Table 1.

6.8 *Agitation*—Select the agitation mode from Table 1.

7. Precision and Bias

7.1 No statement is made about the precision or bias of this practice since the procedure is descriptive with no measurements being made.

8. Keywords

8.1 polymer solutions; solution preparation; solutions; solvents

¹ This practice is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.70 on Analytical Methods.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from John Wiley and Sons, New York, NY.

*A Summary of Changes section appears at the end of this standard.

TABLE 1 Parameters

Designation	Container	Heater Mode	Agitation Mode
A	unspecified	unspecified	unspecified
B	glass	none	none
C	sealed glass vial	oven	random
D	metal	hot plate	magnetic stirrer
E	fluoropolymer	bath	propeller blade
F		block heater	wrist action
G		electric mantle	ultrasonic
H		microwave	

ANNEX

(Mandatory Information)

A1. SUGGESTED SOLVENTS FOR POLYMERIC SOLUTIONS

A1.1 Note the following:

A1.1.1 The solvents are listed in random order.

A1.1.2 An increase in polymer molecular weight reduces solubility.

A1.1.3 Branching increases the solubility compared to a linear polymer of the same molecular weight.

A1.1.4 Solubility normally increases with rising temperature.

A1.1.5 The temperature is for room temperature unless noted.

A1.1.6 The following abbreviations are used:

D.S. degree of substitution

S.C. substituent content

conc. concentrated

A1.2 Solvents:

A1.1.7 *Acrylonitrile-butadiene-acrylate (ABA)*—aromatic hydrocarbons, chlorinated hydrocarbons, tetrahydrofuran, esters, ketones, N,N-dimethylformamide, N,N-dimethylacetamide (if high acrylonitrile).

A1.1.8 *Acrylonitrile-butadiene-styrene (ABS)*—N,N-dimethylformamide, N,N-dimethylacetamide (if high acrylonitrile), cyclohexanone (above 35°C), cyclohexanone/acetone, methylcyclohexane/acetone, decahydronaphthalene/dimethyl oxalate, benzene, toluene, ethylbenzene, styrene, lower chlorinated hydrocarbons, phenol/acetone, tetrahydrofuran, dimethyltetrahydrofuran, dioxane, methyl ethyl ketone, diisopropyl ketone, glycol formal, ethyl acetate, butyl acetate, methyl-, ethyl-, n-butyl phthalate, 1-nitropropane, carbon disulfide, tributyl phosphate, phosphorus trichloride.

A1.1.9 *Alkydes*—tetrahydrofuran.

A1.1.10 *Arylonitrile/methyl methacrylate (AMMA)*—benzene, toluene, xylene, methylene chloride, chloroform, ethylene chloride, chlorobenzene, isobutanol (hot), cyclohexanol (hot), *B*-ethoxyethanol, dioxane, methyl ethyl ketone, diisopropyl ketone, cyclohexanone, acetic acid, isobutyric acid, methyl formate, ethyl acetate, cyclohexyl acetate, isobutyl propionate, butyl lactate.

A1.1.11 *Allyl diglycol carbonate (ADC)*—benzene, chloroform, acetone.

A1.1.12 *Carboxymethyl cellulose (CMC)*:

A1.1.12.1 *S.C.* = 5 to 10 %—alkali.

A1.1.12.2 *S.C.* = 15 to 30 %—water (sodium salt).

A1.1.12.3 *S.C.* = *high*—benzene/alcohol, benzene/acetone, chloroform, pyridine, acetone, esters, tetrahydrofuran.

A1.1.13 *Cellulose Acetate (CA)*:

A1.1.13.1 *D.S.* = 0.6 to 0.8—water.

A1.1.13.2 *D.S.* = 1.3 to 1.7—2-methoxyethanol.

A1.1.13.3 *D.S.* = 2.0 to 2.3—methylene chloride/methanol @ 80:20, chloroform/methanol, benzyl alcohol, phenols, ethylene glycol ethers, dioxane, diethanolamine, pyridine, analine, acetone, cyclohexanone, formic acid, acetic acid (glacial), methyl acetate, ethyl acetate/nitrobenzene, glycol monoethyl ether acetate, nitromethane, tetrahydrofuran.

A1.1.14 *Cellulose acetate-butyrate (CAB)*:

A1.1.14.1 *D.S. (acetate)* = 0.8 and *D.S. (butyrate)* = 2.35—benzene, toluene (hot), chloroform, carbon tetrachloride, tetrachloroethane, methanol (hot), acetone, cyclohexanone, dioxane, aliphatic esters, nitroethane.

A1.1.14.2 *D.S. (acetate)* = 2.1 and *D.S. (butyrate)* = 0.7—chloroform, dichloroethane, tetrachloroethane, dioxane, acetone, cyclohexanone, methyl acetate, ethyl acetate, nitroethane.

A1.1.15 *Cellulose acetate propionate (CAP)*—benzene, dichloromethane, chlorobenzene, acetone, ethyl acetate.

A1.1.16 *Cellulose nitrate (CN)*:

A1.1.16.1 *N* = 6.8 %—water.

A1.1.16.2 *N* = 10.5 to 12 %—alcohol (lower), alcohol/diethyl ether, acetone, amyl acetate, ethylene glycol ethers, acetic acid (glacial).

A1.1.16.3 *N* = 12.7 %—halogenated hydrocarbons, ethanol/diethyl ether, acetone, methyl amyl acetone, cyclohexanone, methyl acetate, ethyl acetate, ethyl butyrate, ethyl lactate, ethylene glycol ether acetates, ethylene carbonate, furan derivatives, nitrobenzene.

A1.1.17 *Cellulose propionate (CP)*—benzene, dichloroethane, chlorobenzene, acetone, ethyl acetate.

A1.1.18 *Cellulose triacetate (CTA)*—methylene chloride, methylene chloride/ethanol @ 80:20, chloroform, chloroform/alcohol, trichloroethane, tetrahydrofuran, dioxane, acetone, acetone/water @ 80:20, methyl acetate, ethylene glycol ether acetates, ethylene carbonate.

A1.1.19 *Diene-modified ethylene-propylene (EPDM)*—1,2,4-trichlorobenzene, toluene @ 75°C, 1,2,4-trichlorobenzene @ 135°C.

A1.1.20 *Epoxy, epoxide (EP)*—tetrahydrofuran.

A1.1.21 *Ethyl cellulose (EC)*:

A1.1.21.1 *D.S. = 0.5 to 0.7*—aqueous alkali.

A1.1.21.2 *D.S. = 1.0 to 1.5*—pyridene, formic acid, water (cold), cuoxam.

A1.1.21.3 *D.S. = 2*—methylene chloride, chloroform, dichloroethylene, chlorohydrins, ethanol, tetrahydrofuran.

A1.1.21.4 *D.S. = 2.3*—benzene, toluene, alkyl halogenids, alcohols, furan derivatives, ketones, acetic esters, carbon disulfide, nitromethane.

A1.1.21.5 *D.S. = 3.0*—benzene, toluene, methylene chloride, alcohols, esters.

A1.1.22 *Ethylene/ethyl acrylate (EEA)*—aromatic hydrocarbons, chlorinated hydrocarbons, tetrahydrofuran, esters, ketones.

A1.1.23 *Ethylene/methacrylic acid (EMA)*—water, aqueous hydrogen chloride (0.002 M above 30°C), dilute aqueous sodium hydroxide.

A1.1.24 *Ethylene-tetrafluoroethylene copolymer (ETFE)*—perfluorokerosene (350°C).

A1.1.25 *Ethylene/vinyl acetate (EVA)*—benzene, toluene, chloroform, carbon tetrachloride/ethanol, dichloroethylene/ethanol @ 20:80, chlorobenzene, methanol, ethanol/water, n-butanol/water, allyl alcohol, 2,4-dimethyl-3-pentanol, benzyl alcohol, tetrahydrofurfuryl alcohol, tetrahydrofuran, dimethyltetrahydrofuran, dioxane, glycol ethers, glycol ether esters, acetone, methyl ethyl ketone, acetic acid, lower aliphatic acids, vinyl acetate, acetals, acetonitrile, nitromethane, N,N-dimethylformamide, dimethyl sulfoxide, 1,2,4-trichlorobenzene @ 135°C (if high ethylene content).

A1.1.26 *Liquid Crystal Polymers (LCP)*—50:50 1,2,4-trichlorobenzene/phenol @ 175°C, pentafluorophenol.

A1.1.27 *Melamine-formaldehyde (MF)*:

A1.1.27.1 *Very low molecular weight*—alcohol, water.

A1.1.27.2 *Intermediates*—pyridine, formalin, formic acids, dilute and concentrated acids.

A1.1.27.3 *High molecular weight*—m-cresol @ 100°C, N,N-dimethylformamide, N,N-dimethylacetamide, N-methyl pyrrolidone @ 85 to 100°C.

A1.1.28 *Phenol-formaldehyde (PF)*:

A1.1.28.1 *Novalks and low molecular weight*—hydrocarbons, diethyl ether, acetone, esters, 4-tert-butylphenol and 4-phenylphenol polymers, drying oils, tetrahydrofuran, methanol.

A1.1.28.2 *Final resins*—molten phenols (with some decomposition).

A1.1.28.3 *Fully cured resins.*

A1.1.29 *Poly(acrylic acid) (PAA)*:

A1.1.29.1 *Atactic*—methanol, ethanol, ethylene glycol, methoxyethanol, dioxane, formamide, N,N-dimethylformamide, water, dilute alkali solution.

A1.1.29.2 *Isotactic*—dioxane/water @ 80:20.

A1.1.30 *Polyacrylonitrile (PAN)*—o-, m-, p-phenylene diamine, N-formylhexamethyleneimine, N-nitrosopiperidine, maleic anhydride, chloromaleic anhydride, succinic anhydride,

acetic anhydride, citraconic anhydride, g-butyrolactone, dioxanone, p-dioxanedione, ethylene oxalate, ethylene carbonate, propylene carbonate, 2-oxazolidone, 1-methyl-2-pyridone, 1,5-dimethyl-2-pyrrolidone, E-caprolactam, N,N-dimethylformamide, dimethylthioformamide, N-methyl-B-cyanoethylformamide, cyanoacetic acid, a-cyano-acetamide, N-methylacetamide, N,N-diethylacetamide, N,N-dimethylacetamide, dimethylmethoxyacetamide, N,N-dimethyl-a,a,a-trifluoroacetamide, N,N-dimethylpropionate, N,N,N',N'-tetramethyloxamide, hydroxyacetonitrile, chloroacetonitrile/water, B-hydroxypropionitrile, malonitrile, fumaronitrile, succinonitrile, adiponitrile, bis(2-cyanoethyl)ether, bis(2-cyanoethyl)sulfide, bis(4-cyanobutyl)sulfone, 1,3,3,5-tetracyanopentane, nitromethane/water (94:6), 1,1,1-trichloro-3-nitro-2-propane, tri(2-cyanoethyl)nitromethane, 3-,4-nitrophenol, methylene dithiocyanate, trimethylene dithiocyanate, dimethyl sulfoxide, tetramethylene sulfoxide, dimethyl sulfone, ethyl methyl sulfone, 2-hydroxyethyl methyl sulfone, ethylene-1,2-bis-(ethyl sulfone), dimethyl phosphite, diethyl phosphite, sulfuric acid, nitric acid, p-phenol sulfonic acid, conc. aqueous lithium chloride, conc. aqueous zinc chloride, conc. aqueous aluminum perchlorate, conc. aqueous sodium thiocyanate, conc. aqueous calcium thiocyanate, molten quaternary ammonium salts and their aqueous solutions.

A1.1.31 *Polyamide (nylon) (PA)*:

A1.1.31.1 *6—m-cresol*, chlorophenol, formic acid, acetic acid, trichloroacetic acid, ethylene carbonate, sulfuric acid, phosphoric acid, hexamethyltrisphosphoramide, hexafluoroisopropanol.

A1.1.31.2 *6:6 (at room temperature)*—trifluoroethanol, trichloroethanol, phenol, cresols, chloral hydrate, formic acid, halogenated acetic acids, hydrogen fluoride, hydrogen cyanide/methanol, liquid sulfur dioxide, sulfuric acid, phosphoric acid, saturated solution of alcohol-soluble salts, for example, calcium chloride, magnesium chloride, in methanol, hexafluoroisopropanol.

A1.1.31.3 *6:6 (at temperatures of 120 to 140°C)*—benzyl alcohol, ethylene chlorohydrin, 1,3-chloropropanol, 2-butene-1,4-diol, diethylene glycol, acetic acid, formamide, N-acetylmorpholine, dimethyl sulfoxide.

A1.1.31.4 *6:10*—chlorobenzene, hexafluoroisopropanol, dimethyl succinate (79°C).

A1.1.31.5 *II*:—higher primary alcohols, N,N-dimethylformamide, dimethyl sulfoxide, hexafluoroisopropanol.

A1.1.32 *Polyamide + Poly(ethylene terephthalate) (PA/PET)*—pentafluorophenol.

A1.1.33 *Poly(butadiene)*—tetrahydrofuran, toluene, chloroform.

A1.1.34 *Polybutadiene-acrylonitrile (PBAN)*—benzene, halogenated hydrocarbons, aliphatic, cycloaliphatic and aromatic hydrocarbons, chlorinated hydrocarbons, tetrahydrofuran, higher ketones, higher aliphatic esters, N,N-dimethylformamide, N,N-dimethylacetamide (if high acrylonitrile content).

A1.1.35 *Polybutadiene-styrene (PBS)*—benzene, halogenated hydrocarbons, aliphatic, cycloaliphatic and aromatic hydrocarbons, chlorinated hydrocarbons, tetrahydrofuran, higher ketones, higher aliphatic esters.

A1.1.36 *Poly(butylene terephthalate) (PBT)*—m-cresol @ 100°C, hexafluoroisopropanol.

A1.1.37 *Polybutene-1 (PB)*—see *polyethylene*.

A1.1.38 *Polycarbonate (PC)*—benzene, chloroform, acetone, tetrahydrofuran, methylene chloride.

A1.1.39 *Polychloroprene (neoprene)*—tetrahydrofuran, toluene.

A1.1.40 *Polyetheretherketone (PEEK)*—50:50 1,2,4-trichlorobenzene/phenol @ 135°C.

A1.1.41 *Polyeth(erimide) (PEI)*—N-methyl pyrrolidone, N,N-dimethylformamide, N,N-dimethylacetamide @ 85°C.

A1.1.42 *Poly(ether sulfone) (PES)*—tetrahydrofuran, N,N-dimethylformamide.

A1.1.43 *Polyethylene (PE)*:

A1.1.43.1 *High density (HDPE) (at temperatures above 80°C)*—aliphatic, cycloaliphatic, and aromatic hydrocarbons, halogenated aliphatic, cycloaliphatic, and aromatic hydrocarbons, higher aliphatic esters and ketones, di-n-amyl ether.

A1.1.43.2 *Low density (LDPE)(LLDPE)*—as above, but temperatures 20 to 30°C lower depending on the degree of branching.

A1.1.44 *Polyethylene, chlorinated, 40 % Cl (CPE) (at elevated temperature)*—tetrahydronaphthalene, toluene, xylene, tetrachloroethane, chlorobenzene, cyclohexanone.

A1.1.45 *Polyethylene, chlorinated, 60 % Cl (CPE)*—tetrahydronaphthalene, benzene, toluene, methylene chloride, chloroform, dioxane, tetrahydrofuran, cyclohexanone, acetone/carbon disulfide @ 1:1.

A1.1.46 *Poly(ethylene oxide) (PEO)*—benzene, toluene, methylene chloride, chloroform, carbon tetrachloride, n-butanol, methyl ethyl ketone, cyclohexanone, water.

A1.1.47 *Poly(ethylene terephthalate) (PET)*—chloral hydrate, phenol, phenol/tetrachloroethane @ 1:1 by volume, phenol/2,4,6-trichlorophenol @ 10:7 by volume, chlorophenol, hexafluoroisopropanol, nitrobenzene, dimethyl sulfoxide (hot), halogenated aliphatic carboxylic acids, m-cresol @ 100°C.

A1.1.48 *Poly(ethylene terephthalate), glycol comonomer (PETG)*—see *Poly(ethylene terephthalate)*.

A1.1.49 *Polyimide (PI)*—N,N-dimethylformamide, N,N-dimethylacetamide, N-methyl pyrrolidone @ 85°C.

A1.1.50 *Polyisobutylene (PIB)*—tetrahydrofuran, toluene.

A1.1.51 *Polyisoprene*—tetrahydrofuran, toluene.

A1.1.52 *Poly(methyl-a-chloroacrylate) (PMCA)*—aromatic hydrocarbons, chlorinated hydrocarbons, tetrahydrofuran, esters, ketones.

A1.1.53 *Poly(methyl methacrylate) (PMMA)*—benzene, toluene, xylene, methylene chloride, chloroform, ethylene chloride, chlorobenzene, isobutanol (hot), cyclohexanol (hot), B-ethoxyethanol, dioxane, methyl ethyl ketone, diisopropyl ketone, cyclohexanone, acetic acid, isobutyric acid, methyl formate, ethyl acetate, cyclohexyl acetate, isobutyl propionate, butyl lactate, ethanol/water, ethanol/carbon tetrachloride, isopropanol/methyl ethyl ketone @ 1:1 above 25°C, formic acid, nitroethane, methylene chloride, hexafluoroisopropanol.

A1.1.54 *Poly(4-methylpentene-1), isotactic (PMP)*—see *Poly(ethylene)*.

A1.1.55 *Polymonochlorotrifluoroethylene (PCTFE)*—cyclohexane (235°C), benzene (200°C), toluene (142°C), p-xylene (140°C), 1,1,1-trichloroethane (120°C), carbon tetrachloride (114°C), 1,2,3-trifluoropentachloropropane, 1,1,2,2-tetrafluoro-3,3,4,4-tetrachlorocyclobutane, 1,2-dichlorotrifluorobenzene, 2,5-dinitrotrifluorobenzene (130°C), mesitylene (140°C), hexamethyltrisphosphoramidate.

A1.1.56 *Polyoxymethylene, polyacetal (POM) (at elevated temperatures)*—benzyl alcohol, phenol, chlorophenols, aniline, formamide, N,N-dimethylformamide, malodinitrile, g-butyrolactone, ethylene carbonate, bromobenzene, diphenyl ether, benzyl benzoate.

A1.1.57 *Poly(phenylene ether) (PPE)*—1,2,4-trichlorobenzene @ 135°C.

A1.1.58 *Polypropylene (PP)*:

A1.1.58.1 *Atactic*—hydrocarbons and chlorinated hydrocarbons at room temperature, isoamyl acetate, diethyl ether.

A1.1.58.2 *Isotactic (at temperatures above 135°C)*—trichlorobenzene, xylenes, decahydronaphthalene.

A1.1.59 *Poly(propylene oxide) (PPO)*—benzene, toluene, carbon tetrachloride, methanol (hot), ethanol, tetrahydrofuran, dioxane, acetone, methyl ethyl ketone.

A1.1.60 *Polysulfone (PSU)*—methylene chloride, N,N-dimethylformamide, dimethyl sulfoxide.

A1.1.61 *Polystyrene (PS)*—cyclohexane (above 35°C), cyclohexane/acetone, methylcyclohexane/acetone, decahydronaphthalene/dimethyl oxalate, benzene, toluene, ethylbenzene, styrene, lower chlorinated aliphatic hydrocarbons, phenol/acetone, tetrahydrofuran, dimethyltetrahydrofuran, dioxane, methyl ethyl ketone, diisopropyl ketone, cyclohexanone, glycol formal, ethyl acetate, butyl acetate, methyl-, ethyl-, n-butyl phthalate, 1-nitropropane, carbon disulfide, tributyl phosphate, phosphorus trichloride.

A1.1.62 *Polytetrafluoroethylene (PTFE)*—perfluorokerosene (350°C).

A1.1.63 *Polyurethane (PUR)*—phenol, m-cresol, formic acid, sulfuric acid, tetrahydrofuran, chloroform, N,N-dimethylformamide.

A1.1.64 *Polyvinylcarbazole (PVK)*—benzene, toluene, xylene, methylene chloride, chloroform, tetrachloroethane, chlorobenzene, tetrahydrofuran, dioxane, cyclohexanone, benzyl acetate, conc. nitric acid, conc. sulfuric acid.

A1.1.65 *Polyvinylpyrrolidone (PVP)*—water.

A1.1.66 *Poly(vinyl acetate) (PVAc)*—benzene, toluene, chloroform, carbon tetrachloride/ethanol, dichloroethylene/ethanol @ 20:80, chlorobenzene, methanol, ethanol/water, n-butanol/water, allyl alcohol, 2,4-dimethyl-3-pentanol, benzyl alcohol, tetrahydrofurfuryl alcohol, tetrahydrofuran, dimethyltetrahydrofuran, dioxane, glycol ethers, glycol ether esters, acetone, methyl ethyl ketone, acetic acid, lower aliphatic esters, vinyl acetate, acetals, acetonitrile, nitromethane, N,N-dimethylformamide, dimethyl sulfoxide.

A1.1.66.1 *Syndiotactic*—chloroform, chlorobenzene.

A1.1.67 *Poly(vinyl alcohol) (PVAL)*—glycols (hot), glycerol (hot), piperazine, methylenediamine, formamide, N,N-dimethylformamide, dimethyl sulfoxide (hot), water, hexamethyltrisphosphoramidate, tetrahydrofuran.

A1.1.68 *Poly(vinyl butural) (PVB)*:

A1.1.68.1 *Acetalization 70%*—alcohols, cyclohexanone, ethyl acetate, ethyl glycol acetate.

A1.1.68.2 *Acetalization 77 %*—methylene chloride, alcohols, acetone, methyl ethyl ketone cyclohexanone, lower esters.

A1.1.68.3 *Acetalization 83 %*—methylene chloride, alcohols, ketones, lower esters.

A1.1.69 *Poly(vinyl chloride) (PVC)*:

A1.1.69.1 *High molecular weight*—tetrahydrofuran, acetone/carbon disulfide, methyl ethyl ketone, cyclopentanone, cyclohexanone, N,N-dimethylformamide, nitrobenzene, dimethyl sulfoxide.

A1.1.69.2 *Low molecular weight*—toluene, xylene, methylene chloride, ethylene chloride, perchloroethylene/acetone, 1,2-dichlorobenzene, dioxane, acetone/carbon disulfide, cyclopentanone, cyclohexanone, diisopropyl ketone, mesityl oxide, isophorone, N,N-dimethylformamide, nitrobenzene, hexamethyltrisphosphoramidate, tricresyl phosphate.

A1.1.69.3 *Chlorinated, 63 %*—aromatic hydrocarbons, chloroform, chlorobenzene, tetrahydrofuran, dioxane, acetone, cyclohexanone, butyl acetate, nitrobenzene, N,N-dimethylformamide, dimethyl sulfoxide.

A1.1.70 *Poly(vinyl chloride-acetate) (PVCA)*—see *Poly(vinyl chloride)*.

A1.1.71 *Poly(vinyl fluoride) (PVF)*—cyclohexanone (hot), N,N-dimethylformamide, dinitrile, N,N-dimethylacetamide (hot), dimethyl sulfoxide (hot).

A1.1.71.1 *Chlorinated, 30 %*—N,N-dimethylformamide.

A1.1.71.2 *Chlorinated, 60 %*—carbon tetrachloride.

A1.1.72 *Poly(vinyl formed) (PVFM)*—benzene/alcohol @ 70:30, toluene, methylene chloride, chloroform, carbon tetrachloride/alcohol @ 70:30, dichloroethylene, dichloroethylene/diacetone alcohol @ 50:50, 2-chloroethanol, benzyl alcohol, furfural, tetrahydrofuran, dioxane, cyclohexanone, formic acid, acetic acid, N,N-dimethylformamide.

A1.1.73 *Poly(vinylidene chloride) (PVDC)*—tetrahydrofuran (hot), tetrahydronaphthalene (hot), trichloroethane, pentachloroethane, 1,2-dichlorobenzene, trichlorobenzene, tetrahydrofurfuryl alcohol, dioxane, cyclohexane, N,N-dimethylamide, butyl acetate, N,N-dimethylformamide, N-methylpyrrolidone, benzonitrile, tetrahydrofuran, cyclohexanone.

A1.1.74 *Poly(vinylidene fluoride) (PVDF)*—cyclohexanone, g-butyrolactone, ethylene carbonate, propylene carbonate, N,N-dimethylacetamide, N-methylpyrrolidone, dimethyl sulfoxide.

A1.1.75 *Silicone plastics (SI)*—tetrahydrofuran, chlorinated hydrocarbons, toluene.

A1.1.76 *Styrene-acrylonitrile (SAN)*—N,N-dimethylformamide (if high acrylonitrile), also see *Polystyrene*.

A1.1.77 *Styrene-butadiene (SB)*—chloroform, toluene.

A1.1.78 *Styrene/a-methylstyrene (SMS)*—see *Polystyrene*.

A1.1.79 *Styrene-rubber plastics (SRP)*—toluene.

A1.1.80 *Unsaturated polyester (UP)*—tetrahydrofuran.

A1.1.81 *Urea-formaldehyde (UF)*—hexafluoro-2-propanol, N,N-dimethylformamide, N,N-dimethylacetamide @ 85°C.

SUMMARY OF CHANGES

This section identifies the location of selected changes to this practice. For the convenience of the user, Committee D20 has highlighted those changes that may impact the use of this practice. This section may also include descriptions of the changes or reasons for the changes, or both.

D 5226 – 97:

(I) Added ISO equivalency statement (Note 1).

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