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Standard Terminology Relating to Rubber and Rubber Latices—Abbreviations for Chemicals Used in Compounding[1]

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ϵ^1 NOTE—Section 5 was editorially updated in February 2003.

[1] This terminology is under the jurisdiction of ASTM Committee D-11 on Rubber and is the direct responsibility of Subcommittee D11.08 on Terminology.

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1. Scope

1.1 This terminology is a compilation of abbreviations for accelerators, vulcanizing agents, activators, anti-degradants, plasticizers, softeners, processing ~~aids and~~ aids, blowing agents, retarders, isocyanates, peroxides, and antireversion agents used in the compounding of rubber products. Abbreviations for rubbers are listed in Practice D 1418 and a numbering system for various grades of carbon blacks is described in Classification D 1765.

2. Referenced Documents

2.1 *ASTM Standards:*

D 1418 Practice for Rubber and Rubber Latices—Nomenclature[2]

D 1600 Terminology for Abbreviated Terms Relating to Plastics[3]

D 1566 Terminology Relating to Rubber[2]

D 1765 Classification System for Carbon Blacks Used in Rubber Products[2]

2.2 *ISO Standard:*[4]

ISO 6472 Rubber Compounding Ingredients—Abbreviations

3. Significance and Use

3.1 These abbreviations are to be used in technical writing where the full chemical name of the substance is used initially, followed by the abbreviation found in this terminology. Later references to this substance may then use the abbreviation only.

4. Form and Style

4.1 Although generally accepted references[4,5,6] for naming chemicals provide the basis for these abbreviations, common usage has dictated the particular choice for the abbreviations set forth in this terminology.

4.2 Conventions used in this terminology are:

4.2.1 The symbol B will be used for butyl in the case of accelerators and vulcanizing agents and for butylidene in the case of bisphenol materials (see 4.2.6.2).

4.2.2 The symbol Bz will be used for benzyl groups.

4.2.3 When possible, a number will be used to denote long chain hydrocarbons, that is, 5 for penta, 88 for dioctyl, etc. If the length of the hydrocarbon chain is ten or higher, the number shall be placed in parenthesis, that is (12) for dodecyl, etc. The letter "*i*" shall be used to denote an iso structure.

4.2.4 The chemical symbol for metallic components will be used whenever possible. This will usually occur at the beginning of the abbreviation.

[2] *Annual Book of ASTM Standards*, Vol 09.01.

[3] *Annual Book of ASTM Standards*, Vol 08.01.

[4] Available from American National Standards ~~Institute, 11 West 42nd~~ Institute (ANSI), 25 W. 43rd St., ~~13th~~ 4th Floor, New York, NY 10036.

[5] *A Guide to IUPAC Nomenclature of Organic ~~Chemistry~~, Compounds*, ~~Sections A, B, and C, 3rd ed., Butterworth, London, 1971.~~ CRC Press, Boca Raton, FL, 1993.

[6] ~~Fletcher, J. H., Dermer, O. C., and Fox,~~

[6] Fox, R. B., ~~eds.,~~ *Nomenclature of Organic Compounds*, ~~Advances in Chemistry Series No. 126, Am. Chem. Soc.,~~ American Chemical Society, Washington, DC, ~~1974.~~ 2001.

4.2.5 The symbol C will be used for dithiocarbamate accelerators and for cyclohexyl in the case of sulfenamide accelerators and bisphenol antioxidants.

4.2.6 Commercial bisphenol antioxidants are made up of two alkyl/cyclohexyl substituted phenol rings linked in the ortho or para position. The following conventions will be used in this nomenclature scheme:

4.2.6.1 *o*—ortho
m—meta
p—para
Bp—bisphenol structure

4.2.6.2 M—methylene
B—butylidene
IB—isobutylidene
IP—isopropylidene
T—thio

4.2.6.3 1—methyl
2—ethyl
4— *t*-butyl
9—nonyl
C—cyclohexyl

4.2.7 For diphenylamine antidegradants use numbers for the identification of alkyl substituents on the diphenylamine rings.

5. Abbreviations

ACCELERATORS AND VULCANIZING AGENTS

BA—butyraldehyde–aniline condensate.
BiDMC—bismuth dimethyldithiocarbamate.
BMTS—bis–morpholino–thiocarbamyl sulfenamide.
CBS—*N*-cyclohexyl-2-benzothiazolesulfenamide.
CdDEC—cadmium diethyldithiocarbamate.
CdDMC—cadmium dimethyldithiocarbamate.
Cd5MC—cadmium pentamethylenedithiocarbamate.
CEA—cyclohexylethylamine.
CuDIP—copper diisopropyldithiophosphate.
CuDMC—copper dimethyldithiocarbamate.
CuMBT—copper 2-mercaptobenzothiazole.
DBA—dibutylamine.
DBQD—p,p′–dibenzoyl–p–benzoquinone ~~dioxime or quinone dioxime dibenzoate.~~ dioxime.
DBTU—1,3-dibutylthiourea.
DBXD—dibutyl xanthogen disulfide.
DBzA—dibenzylamine.
DCBS—*N*,*N*–dicyclohexyl–2–benzothiazyl sulfenamide.
DEPTD—sym. diethyldiphenylthiuram disulfide *N*,*N*′di-ethyl-*N*,*N*′-diphenylthiuram disulfide.
DETU—1,3-diethylthiourea.
~~DIBS—*N*,*N*–diisopropyl–2–benzothiazyl sulfenamide.~~
DMPTD—dimethyl diphenyl thiuram disulfide.
DOTG—di-tolylguanidine.
DPG—diphenylguanidine.
DPTD—dipentamethylenethiuram disulfide.
DPTH—dipentamethylenethiuram hexasulfide.
DPTM—dipentamethylenethiuram monosulfide.
DPTT—dipentamethylene thiuram tetrasulfide
DPTU—*N*,*N*-diphenylthiourea (thiocarbanalide).
DTDM—dithiodimorpholine.
DTTU—*N*,*N*′–di–o–tolylthiourea.
EFA—ethyl chloride, formaldehyde, and ammonia reaction product.
ETU—ethylene thiourea.
HMD—hexamethylene diamine.
HMDC—hexamethylenediamine carbamate.
HMMA—*N*,*N*′-hexamethylene-bis-methacrylamide.

HMT—hexamethylenetetramine.
MBSS—4–morpholinyl–2–benzothiazyl disulfide.
MBS—2–(morpholinothio)benzothiazole.
MBSS—2-benzothiazole-N-morpholydisulfide.
MBT—2-mercaptobenzothiazole.
MBTS—benzothiazyl disulfide.
M-o-CA—4-4′-methylene-bis-(chloroaniline).
m-PBM—*N, N′-m*-phenylene-bis-maleimide.
MPTD—*N,N′*-dimethyl-*N,N′*diphenylthiuram disulfide.
MTT—3-methyl-thiazolidine-thione-2.
NaDMC—sodium dimethyldithiocarbamate.
NaDBC—sodium dibutyldithiocarbamate.
NaDEC—sodium diethyldithiocarbamate.
NaIX—sodium isopropylxanthate.
OTBG— *o*-tolylbiguanide.
OTOS—*N*-oxydiethylene thiocarbamyl-N′-oxydiethylene sulfenamide.
PbDAC—lead diamyldithiocarbamate.
PbDMC—lead dimethyldithiocarbamate.
PBQD—*p*-benzoquinone dioxime.
P5MC—piperidinium pentamethylenedithiocarbamate.
SeDEC—selenium diethyldithiocarbamate.
SeMDC—selenium dimethyldithiocarbamate.
TAC—triallyl cyanurate.
TAIC—triallyl isocyanurate.
TBBS—*N*-butyl-benzothiazolesulfenamide.
TBSI— *t*-butyl-2–benzothiazole sulfenimide
TBTD—tetrabutylthiuram disulfide.
TBTU—1,1,3–tributylthiourea.
TBzTD—tetrabenzylthiuram disulfide.
TCT—tricrotonylidenetetramine.
TeDEC—tellurium diethyldithiocarbamate.
TeDMC—tellurium dimethyldithiocarbamate.
TIBTD—tetraisobutylthiuram disulfide
TETD—tetraethylthiuram disulfide.
TMTD—tetramethylthiuram disulfide.
TMTM—tetramethylthiuram monosulfide.
TU—thiourea.
ZnBX—zinc butylxanthate.
ZnDBC—zinc dibutyldithiocarbamate.
ZnDBP—zinc dibutyldithiophosphate.
ZnDBzC—zinc dibenzyldithiocarbamate.
ZnDEC—zinc diethyldithiocarbamate.
ZnDIBC—zinc diisobutyldithiocarbamate
ZnDMC—zinc dimethyldithiocarbamate.
ZnEHBP—zinc ethylhexyl-*n*-butyldithiophosphate.
ZnEPC—zinc ethylphenyldithiocarbamate.
ZnEX—zinc ethylxanthate.
ZnIX—zinc isopropylxanthate.
ZnMBT—zinc-2-mercaptobenzothiazole.
Zn5MC—zinc pentamethylenedithiocarbamate.

PEROXIDES

BBPIB—1, 4-bis-(t-butylperoxyisopropyl) benzene.
BPO—benzoyl peroxide.
BPV—n-butyl bis (4,4-tert-butylperoxy) valerate.
DBPC—1,1-bis (butylperoxy)-3,5,5-trimethyl-cyclohexane.
DCPB—2,4-dichlorobenzoyl peroxide.
DCP—dicumyl peroxide.
DMBPHa—2,5-dimethyl-2,5-di-(butyl peroxy) hexane.

DMBPHy—2,5-dimethyl-2,5-di-(butyl peroxy) hexyne-3.
DTBP—di-t-butyl peroxide.
EBPB—ethyl-3,3 bis (butyl peroxy) butrylate.
MBPP—4-methyl-2,2-bis-(butyl peroxy) pentane.
TBCP—butyl cumyl peroxide.
TSS—toluene sulfonylsemicarbazide

ANTIDEGRADANTS (ANTIOXIDANTS AND ANTIOZONANTS)

AANA—aldol-α-naphthylamine.
ADPA—acetone diphenylamine condensation product
APPD—*N*-alkyl-*N′*-phenyl-*p* -phenylenediamine.
p-BBp14—4,4′-butylidene-bis-(6-t-butyl-m-cresol).
BHA—butylated hydroxyanisole.
BHT—2, 6-di–butyl–4–methylphenol (butylated hydroxy toluene).
CPPD—*N*-cyclohexyl-*N′*-phenyl-*p*-phenylenediamine.
~~DAHQ—2,5-di-amylhydroquinone.~~
DBHQ—2,5-di-tert-butylhydroquinone.
DLTDP—dilauryl thiodipropionate.
i88PD—*N,N′*-bis-(1-methylheptyl)- *p*-phenylenediamine.

NOTE 1—This is a specific isomer of *N,N′*-dioctyl- *p*-phenylenediamine (see ISO 6472).

DNPD—*N, N′*-di-2-naphthyl-*p*-phenylenediamine.
DOPD—dioctyl-*p*-phenylenediamine.
DPA—diphenylamine.
DPPD—N,N′–diphenyl-*p*-phenylenediamine.
DSTDP—distearylthiodipropionate
DTPD—*N,N′*-ditolyl-*p*-phenylenediamine.
ETMQ—6-ethoxy-1,2-dihydro-2,2,4-trimethylquinoline.
o-IBBp11—2,2′-isobutylidene-bis-(4,6-di-methylphenol).
p-IPBp(4)$_n$—polybutylated bisphenol A.
IPPD—*N*-isopropyl-*N ′*-phenyl-*p*-phenylenediamine.
MBI—2-mercaptobenzimidazole.
o-MBp1C—2,2′-methylene-bis-(4-methyl-6-cyclohexylphenol).
o-MBp1(1C)—2,2′-methylene-bis-[6-(1-methyl cyclohexyl)p-cresol].
o-MBp14—2,2′-methylene-bis-(4-methyl-6-t-butylphenol).
o-MBp19—2,2′-methylene-bis-(4-methyl-6-nonylphenol).
o-MBp24—2,2′-methylene-bis-(4-ethyl-6-t-butylphenol).
p-MBp44—4,4′-methylene-bis-(2,6-di-t-butylphenol).
MMBI—methyl-2-mercaptobenzimidazole.
NiDBC—nickel dibutyldithiocarbamate.
8DPA—octylated diphenylamine.
PAN— *N*-phenyl-*alpha*-naphthylamine.
PBN—*N*-phenyl-*beta*-naphthylamine.
i–8PPD—*N*-phenyl- *N′*-2-octyl-*p*-phenylenediamine.
P3DPA—*p*-isopropoxylateddiphenylamine.
SPDA—styrenated diphenylamine.
SPH—styrenated phenol.
p-BBp14—4,4′-butylidene-bis-(2-*t*-butyl- *m*-cresol).
p-TBp14—4,4′-thio-bis-(2-*t*-butyl- *m*-cresol).
TAHQ—2,5-di-amylhydroquinone.
TMQ—2,2,4-trimethyl-1,2-dihdroquinoline (oligomer).
TNPP—tri(nonylphenyl)phosphite.
ZnMBI—zinc-2-mercaptobenzimidazole.
ZnMMBI—zinc–methyl-2-mercaptobenzimidazole.
6PPD—*N*-(1,3-dimethylbutyl)-*N′*-phenyl-*p*-phenylenediamine.
6QDI—*N*-phenyl-*N′*-(1,3-dimethylbutyl)-2,5–cyclohexadiene-1,4-diimine.
7PPD—*N*-(1,4-dimethylpentyl)-*N′*-phenyl-p-phenylenediamine.
77PD—*N,N′*-bis-(1,4-dimethylpentyl)-*p*-phenylenediamine.
8PPD—*N*-octyl- *N′*-phenyl-*p*-phenylenediamine.

88PD—N,N′–dioctyl-*p*-phenylenediamine.
9DPA—nonylated diphenylamine.
29DPA—ethylated/nonylated diphenylamine.
48DPA—butylated/octylated diphenylamine

PLASTICIZERS AND SOFTENERS
(See Terminology D 1600)

BOP—butyl octyl phthalate.
DBP—dibutyl phthalate.
DBS—dibutyl sebacate.
DCHP—dicyclohexyl phthalate
DEP—diethyl phthalate.
DIBA—diisobutyl adipate.
DIBP—diisobutyl phthalate.
DIDA—diisodecyl adipate.
DIDP—diisodecyl phthalate.
DIOA—diisooctyl adipate.
DIOP—diisooctyl phthalate.
DMP—dimethyl phthalate.
DMS—dimethyl sebacate.
DOA—dioctyl adipate.
DOP—dioctyl phthalate.
DOS—dioctyl sebacate.
DOTP—dioctyl terephthalate.
-or-di-(2-ethylhexyl) terephthalate.
DPCF—diphenyl cresyl phosphate
DPOF—diphenyl octyl phosphate
DPP—diphenyl phthalate.
DUP—diundecyl phthalate.
ELO—epoxidized linseed oil.
ESO—epoxidized soya bean oil.
ODA—octyl decyl adipate.
TCEF—trichloroethyl phosphate
TCF—cresyl phosphate
TOF—trioctyl phosphate
TOTM—trioctyl trimellitate.

ACTIVATORS AND PROCESS AIDS

DEA—diethanolamine.
DEG—diethylene glycol.
GTMA—glyceryl trimethacrylate.
PEG—polyethylene glycol.
PPG—polypropylene glycol.
PVME—polyvinyl methyl ether.
NaPCP—sodium pentachlorophenate.
TEA—triethanolamine.
ZnEH—zinc 2-ethylhexanoate (zinc octoate).

BLOWING AGENTS

ADC—azodicarbonamide.
BDSH—benzene-1,3-disulfonylhydrazide.
BSH—benzene sulfonylhydrazide.
DNPT—dinitrosopentamethylenetetramine.
OBSH—oxy-bis-(benzene sulfonylhydrazide)
TSH—toluene sulfonylhydrazide
TSS—toluene sulfonylsemicarbazide

~~**PEROXIDES**~~

~~BBPIB—1, 4-bis-(t-butylperoxyisopropyl) benzene.~~
~~BPO—benzoyl peroxide.~~

~~BPV—n-butyl bis (4,4-tert-butylperoxy) valerate.~~
~~DBPC—1,1-bis (butylperoxy)-3,5,5-trimethyl-cyclohexane.~~
~~DCPB—2,4-dichlorobenzoyl peroxide.~~
~~DCP—dicumyl peroxide.~~
~~DMBPHa—2,5-dimethyl-2,5-di-(butyl peroxy) hexane.~~
~~DMBPHy—2,5-dimethyl-2,5-di-(butyl peroxy) hexyne-3.~~
~~DTBP—di-t-butyl peroxide.~~
~~EBPB—ethyl-3,3 bis (butyl peroxy) butrylate.~~
~~MBPP—4-methyl-2,2-bis-(butyl peroxy) pentane.~~
~~TBCP—butyl cumyl peroxide.~~
~~TBPB—butyl perbenzoate.~~

ISOCYANATES

CHDI—1,4-cyclohexane diisocyanate.
HDI—1,6-hexamethylene diisocyanate.
HMDI—4,4′-dicyclohexylmethane diisocyanate.
IPDI—isophorone diisocyanate.
MDI—4,4′-diphenylmethane diisocyanate.
NDI—naphthalene-1,5-diisocyanate.
PMPPI—polymethylene polyphenyl isocyanate.
PPDI—p-phenylene di-isocyanate.
TDI—toluene di-isocyanate.
TMDI—2,2,4- and 2,4,4-trimethyl hexamethylene diisocyanate.
TMXDI—m-tetramethylxylylene diisocyanate.
TTI—4,4′,4″-triphenylmethane triisocyanate.
TIPT—tris-(p-iscyanatophenyl)-thiophosphate.

RETARDERS

CTP—*N*-(cyclohexylthiop)phthalimide.
NDPA—*N*–nitroso diphenylamine
PTA—phthalic anhydride.
SA—salicylic acid.

ANTIREVERSION AGENTS

CIMX—1,3-bis(citraconimidomethyl)benzene.
DHTS—hexamethylene-1,6-bis(thiosulfate) disodium salt dihydrate.

6. Keywords

accelerators; activators; antidegradants; antireversion agents; blowing agents; isocyanates; peroxides; plasticizers; processing aids; retarders; vulcanizing agents