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Responder® Permeation Test Data

Chemical Name	Concentration	Breakthrough Time	Permeation Rate	SDL
	(%)	Normalized (min)	(ug/cm2/min)	(ppm)
1,1,2,2-TETRACHLOROETHANE	95+	>480	0.0005	
1,1,2-TRICHLOROETHANE	95+	>480	<0.01	
1,3-DICHLOROACETONE (40ºC)	95+	>480	<0.01	
1,4-DIOXANE	95+	>480	<0.05	
1,6-HEXAMETHYLENEDIAMINE	95+	>480	<0.01	
2,2,2-TRICHLOROETHANOL	95+	>480	<0.01	
2,2,2-TRIFLUOROETHANOL	95+	>480	<0.001	
2,3-DICHLOROPROPENE	95+	>480	<0.008	
2-CHLOROETHANOL	95+	>480	<0.008	
2-PICOLINE	95+	46	48	
3,4-DICHLOROANILINE	95+	>480	<0.001	
3,4-DICHLOROANILINE (70ºC)	95+	284	2.4	
3-PICOLINE	95+	11	22	
4,4'METHYLENE BIS(2-CHLOROANILINE)	95+	>480	<0.1	
ACETALDEHYDE	99	>480	ND*	.05
ACETIC ACID	99	>480	ND*	1.00
ACETIC ANHYDRIDE	95+	>480	<0.1	
ACETONE	100	>480	ND*	.13
ACETONITRILE	95	>480	ND*	.11
ACETYL CHLORIDE	95+	>240	ND*	.01
ACROLEIN	95+	>480	<0.02	
ACRYLAMIDE	50% in water	>480	ND*	1.0
ACRYLIC ACID	99	>480	ND*	.1
ACRYLONITRILE	99	>480	ND*	.01
ALLYL ALCOHOL	99	>480	ND*	.30
ALLYL CHLORIDE	95+	>480	ND*	.04
ALUMINUM SULFATE	27	>480	ND*	0.025
AMINOPYRIDINE-2	95+	321	112	
AMMONIA GAS	100	>480	ND*	0.088
AMMONIA LIQUID	100	>480	ND*	.145
AMMONIUM FLUORIDE	95+	>480	<0.01	
AMYL ACETATE	99	>480	ND*	.084
ANILINE	99	>480	ND*	1.00
ANTIKNOCK COMPOUNDS	63	>480	ND*	.01
ARSINE	99	>180	ND*	.78
BENZENE	100	>480	ND*	.01
BENZIDINE, 25% in METHANOL	95+	>480	<0.01	

BENZO[a]PYRENE	95+	>480	<0.8	
BENZONITRILE	99	>480	ND*	.01
BENZOYL CHLORIDE	95+	>480	<0.05	
BENZYL ALCOHOL	95+	>480	<0.1	
BENZYL CHLORIDE	99	>480	ND*	.01
BORON TRICHLORIDE	100	>480	ND*	0.05
BORON TRIFLUORIDE	100	>480	ND*	.1
BROMINE	99	18	533.3	0.39
BROMOCHLOROMETHANE	95+	>180	ND*	.01
BUTADIENE 1,3-	99	>480	ND*	.066
BUTANOL N-	99	>480	ND*	.072
BUTYL ACRYLATE	99	>480	<0.1	
BUTYL CELLOSOLVE	95+	>480	<0.003	
BUTYL ETHER N-	99	>480	ND*	.025
BUTYL METHYL ETHER T-	100	>480	<0.007	
BUTYLAMINE	99	>480	<0.1	
BUTYLENE OXIDE 1,2-	95+	>240	ND*	.01
BUTYRALDEHYDE	100	>480	ND*	.03
BUTYRIC ACID	95+	>480	<0.1	
CALCIUM CHLORIDE	42% w/w in water	>240	ND*	1.00
CARBON DISULFIDE	100	>480	ND*	1.00
CARBON TETRACHLORIDE	UNK	>480	ND*	.6
CHLORINE DIOXIDE	5	>480	ND*	1.00
CHLORINE GAS	100	>480	ND*	.041
CHLORINE GAS (20ppm)	20 ppm	>480	ND	
CHLORINE LIQUID	100	>480	ND*	5.00
CHLORINE TRIFLUORIDE	100	160	>53	1.00
CHLORO-1,3 BUTADIENE 2-	99	>480	ND*	.01
CHLOROACETIC ACID	99	60	63.7	.06
CHLOROACETIC ACID (65ºC)	95+	60	63.7	
CHLOROACETIC ACID (75-80%)	75	>480	<0.01	
CHLOROACETOPHENONE	97	>480	ND*	.5
CHLOROACETYL CHLORIDE	95+	>480	<0.1	
CHLOROACRYLONITRILE 2-	99	>480	ND*	0.16
CHLOROBENZENE	99	>480	ND*	.5
CHLOROFORM	99	>480	ND*	.097
CHLOROMETHYL METHYL ETHER	TECH	>480	ND	.12
CHLOROPICRIN	98	>480	ND*	.1
CHLOROSULFONIC ACID	99	>480	ND*	1.00
CHROMIC ACID	60	>480	ND*	1.0
CRESOL, MIXED ISOMERS	95+	>480	<0.1	
CRESOLS	MIXTURE	>480	ND*	.01
CROTONALDEHYDE	99	>480	ND*	.1
CRUDE OIL	95+	>480	<0.04	
CUMENE	95+	>480	<0.01	

CYCLOHEXANE	99	>480	ND*	.01
CYCLOHEXYL ISOCYANATE	95+	>480	<0.1	
CYCLOHEXYLAMINE	99	>480	<0.1	
DI (2-ETHYLHEXYL) PHTHALATE	95+	>480	<0.07	
DIBORANE	10	>480	ND*	0.02
DICHLORO-2-BUTENE 1,4-	85	>480	ND*	.3
DICHLOROACETYL CHLORIDE	95+	100	20.5	
DICHLOROETHYL ETHER	95+	>480	<0.01	
DICHLOROETHYLENE 1,2-	95+	>180	ND*	.01
DICHLOROMETHANE	99	>480	ND*	.16
DICHLOROPROPANE 1,2-	95+	>480	<0.01	
DICHLOROPROPENE 1,3-	95	>480	ND*	.2
DICHLOROSILANE	97	>480	ND*	0.05
DIESEL FUEL	95+	>480	ND*	0.11
DIETHANOLAMINE	99	>480	ND*	1.0
DIETHYL SULFATE	98	>480	ND*	0.090
DIETHYLAMINE	98	>480	ND*	0.71
DIETHYLANILINE CRUDE	95+	>480	<0.1	
DIETHYLENETRIAMINE	95+	>480	<0.01	
DIISOCYANATOHEXANE	98	>480	<0.1	
DIMETHYL ACETAMIDE N, N-	100	>480	ND*	26.00
DIMETHYL DISULFIDE	99	>480	ND*	.01
DIMETHYL HYDRAZINE	98	>480	<0.1	
DIMETHYLFORMAMIDE N,N-	99	>480	ND*	1.0
DIMETHYLMALEATE	95+	>480	<0.1	
DIMETHYLSULFATE	99	>480	ND*	.4
DINITRO-O-CRESOL, saturated solution in Methanol	sat.	>480	<0.013	
DIPHENYLMETHANE DIISOCYANATE 4,4-	100	>480	<0.1	
d-LIMONENE	95+	>480	<0.001	
EPICHLOROHYDRIN	95+	>480	<0.1	
ETHANOLAMINE	95+	>480	<0.1	
ETHYL ACETATE	100	>480	ND*	.1
ETHYL ACRYLATE	99	>480	ND*	.2
ETHYL BENZENE	99	>480	<0.1	
ETHYL CELLOSOLVE ACETATE	95+	>480	<0.002	
ETHYL ETHER	95+	>480	<0.01	
ETHYL METHACRYLATE	95+	>240	ND*	.01
ETHYL VINYL ETHER	95+	>180	ND*	.02
ETHYLAMINE	70 W/W	>240	ND*	.02
ETHYLAMINE (15ºC)	95+	361	1.49	
ETHYLENE	99	>480	ND*	.02
ETHYLENE DIAMINE	99	>480	ND*	.01
ETHYLENE DIBROMIDE	95+	>480	<0.1	
ETHYLENE DICHLORIDE	99	>480	ND*	.053

ETHYLENE DIGLYCOL MONOETHYL ETHER	95+	>480	<0.07	
ETHYLENE GLYCOL	95+	>480	ND*	.12
ETHYLENE OXIDE GAS	100	>480	ND*	.21
ETHYLENE OXIDE LIQUID (0ºC)	95+	>480	<0.01	
ETHYLENE OXIDE LIQUID (11ºC)	100	>180	ND*	0.083
ETHYLENEIMINE	99	357	.032	.01
FERRIC CHLORIDE	SATURATED	>480	ND*	1.00
FERROUS CHLORIDE	SATURATED	>480	ND*	1.00
FLUORINE	TECH	>480	ND*	.014
FLUOSILICIC ACID	30	>480	ND*	1.00
FORMALIN	37	>480	<0.09	
FORMIC ACID	96	>480	ND*	.1
FREON TF	UNK	>240	ND*	10.0
FUEL OIL	95+	>480	<0.01	
FURFURAL	95+	>480	<0.01	
GAMMA-BUTYROLACTONE	100	>480	ND*	0.02
GASOLINE, LEADED	95+	>480	ND*	.056
GLUTERALDEHYDE	50	>480	<0.1	
GLUTERALDEHYDE, 5%	5	>480	<0.1	
GLYCOLIC ACID	sat. solution in water	>480	<0.1	
HEXACHLOROBUTADIENE 1,3-	98	>480	ND*	.5
HEXAFLUOROISOBUTYLENE	95+	>480	<0.02	
HEXAMETHYLDISILAZANE	100	>480	ND*	0.09
HEXAMETHYLDISILAZANE	95+	>480	<0.03	
HEXANE	99	>480	<0.1	.06
HEXENE 1-	99	>480	ND*	.01
HYDRAZINE	98	>480	ND*	0.02
HYDRAZINE HYDRATE	UNK	>240	<0.1	
HYDRAZINE HYDRATE, 85%	85	440	0.06	
HYDROBROMIC ACID	48	>480	ND*	.19
HYDROCHLORIC ACID	37% W/W	>240	ND*	.20
HYDROFLUORIC ACID	49-51	>480	ND*	.025
HYDROGEN CHLORIDE	99	>480	ND*	.056
HYDROGEN CYANIDE	98+	>480	ND*	0.50
HYDROGEN FLUORIDE ANHYDROUS	99	>480	ND*	0.20
HYDROGEN FLUORIDE GAS	99	>480	ND*	0.01
HYDROGEN PEROXIDE, 30%	30	>480	<0.1	
HYDROGEN PEROXIDE, 70%	70	>480	<0.1	
HYDROGEN SULFIDE	100	>180	ND*	12.00
IODINE	95+	>480	<70	
ISOAMYL ALCOHOL	95+	>480	<0.1	
ISOBUTANE	99	>480	ND*	.01
ISOBUTANOL	99	>480	ND*	.3

ISOBUTYL BENZENE	99	>480	ND*	.01
ISOPHORONE DIISOCYANATE	98	>480	<0.1	
ISOPRENE	95+	>180	ND*	.01
ISOPROPYL ALCOHOL	99	>480	ND*	.01
ISOPROPYLAMINE	99	>480	<0.01	
JET FUEL A	95+	>480	<0.1	
JP-4 FUEL	95+	>480	<0.002	
JP-8 FUEL	95+	>480	<0.1	
LEWISITE (L) CHEMICAL AGENT	99	>480	N/A	N/A
LINDANE, SAT. SOLUTION IN ACETONE	sat. solution	>480	<0.06	
MALATHION	50	>480	ND*	0.04
MALEIC ACID	SATURATED	>480	ND*	1.00
MALEIC ANHYDRIDE	SATURATED	>480	ND*	1.00
m-CRESOL	95+	>480	<0.09	
MERCURIC CHLORIDE	95+	>480	<0.28	
MERCURY	100	>480	<0.1	
MESITYL OXIDE	98	>480	ND*	
METHACRYLIC ACID	99	>480	ND*	
METHANE	99	>480	ND*	
METHANOL	100	>480	ND*	
METHYL ACRYLATE	100	>480	<0.1	
METHYL BROMIDE	100	>480	ND*	0.10
METHYL CELLOSOLVE	95+	>480	<0.01	
METHYL CELLOSOLVE ACETATE	95+	>480	<0.01	
METHYL CHLORIDE	100	>480	ND*	.089
METHYL CHLOROFORMATE	95+	>480	0.011	
METHYL ETHYL KETONE	95+	>240	ND*	0.01
METHYL FLUORIDE	99	>480	ND*	0.50
METHYL HYDRAZINE	98	>480	ND*	.04
METHYL IODIDE	100	>480	<0.1	
METHYL ISOCYANATE	95+	>480	ND*	1.00
METHYL MERCAPTAN	UNK	>480	ND*	.8
METHYL METHACRYLATE	95+	>480	<0.02	
METHYL SULFOXIDE	95+	>240	ND*	.01
METHYLAMINE (GAS)	98	>480	ND*	.01
METHYLAMINE (LIQUID)	40	261	1.8	
METHYLAMINE (LIQUID, 50%)	50	232	2.2	
METHYLENE DIANILINE (15% SOL. IN MEK	15	>480	<0.1	

METHYLENE DIANILINE (15% SOL. IN WATER)	15	>480	ND*	.10
METHYLISOBUTYLKETONE	100	>480	ND*	.048
MINERAL OIL	95+	>480	<0.08	
m-TOLUIDINE	95+	>480	<0.001	
MUSTARD (HD) CHEMICAL AGENT	99	>480	N/A	N/A
N,N-DIMETHYLANILINE	95+	>480	<0.13	
n-BUTYL ACETATE	95+	>480	<0.01	
NERVE (VX) CHEMICAL AGENT	99	>480	N/A	N/A
NICOTINE	98	>480	ND*	.01
NITRIC ACID	70	>180	ND*	.07
NITRIC ACID-RED FUMING	90+	>180	ND*	.089
NITROBENZENE	99	>480	ND*	1.00
NITROGEN TETROXIDE	UNK	220	7	.051
NITROGEN TRIFLUORIDE	100	>480	ND*	0.10
NITROMETHANE	99	>480	ND*	.31
NITROUS OXIDE	100	>480	ND*	.05
N-METHYL PYRROLIDONE	95+	>480	<0.01	
O-CRESOL	95+	>480	0.17	
OCTANE	99	>480	<0.1	
OCTEL ANTIKNOCK COMPOUND	99	>480	ND*	.01
OLEUM	40	>480	ND*	.06
ORGANO-TIN PAINT	UNK	>240	ND*	.03
OXALIC ACID	10.5	>480	<0.1	
PCB	UNK	>240	ND*	.01
PCB 1254	95+	>480	<0.2	
PCB GAS CONDENSATE	95+	401	0.36	
PCB, 50% IN MINERAL OIL	95+	>480	<0.1	
PCB, 90% MINERAL OIL, 6% TCB	95+	60	0.04	
PCB, 99% IN MINERAL OIL	95+	>480	<0.1	
p-CHLOROANILINE	sat. solution in water	>480	<0.09	
p-CHLOROPHENOL	95+	>480	<0.013	
PENTACHLOROPHENOL	sat.	>480	<0.013	
PENTENENITRILE 2-	100	>480	ND*	.12
PHENETHYL ALCOHOL a-	100	>480	<0.1	
PHENOL	85	>480	ND	.01
PHENYL ETHYL ALCOHOL	95+	>480	<0.1	
PHENYL GLYCIDYL ETHER	95+	>480	<0.1	
PHOSGENE	99	>480	ND*	.10
PHOSPHINE	99	>480	ND*	.03
PHOSPHORIC ACID	85	>480	ND*	1.0
PHOSPHOROUS OXYCHLORIDE	99	>480	ND*	1.0
POTASSIUM PERMANGANATE	30	>480	ND*	0.025
PROPANE	99	>480	ND*	.30

PROPIONALDEHYDE	100	>480	ND*	2.00
PROPIONIC ACID	95+	>480	<0.1	
PROPYLENE OXIDE	95+	>480	ND*	.03
PSEUDO CUMENE	90	>480	ND*	.041
PYRIDINE	99	>480	ND*	.23
SARIN (GB) CHEMICAL AGENT	99	>480	N/A	N/A
SILANE	99+	>480	ND*	0.50
SODIUM CYANIDE	45	>480	ND*	1.0
SODIUM DICHROMATE	0.5	>480	ND*	1.00
SODIUM HYDROSULFIDE	SATURATED	>480	ND*	1.00
SODIUM HYDROXIDE	100	>480	ND*	.2
SODIUM HYPOCHLORITE	5.25	>480	ND*	3.00
SOMAN (GD) CHEMICAL AGENT	99	>480	N/A	N/A
STODDARD SOLVENT	95+	>480	<0.001	
STYRENE	99	>480	<0.1	
SULFUR DICHLORIDE	80	448	.33	.084
SULFUR DIOXIDE	99	>480	ND*	.04
SULFUR HEXAFLUORIDE	100	>480	ND*	0.10
SULFUR TRIOXIDE	99	90	>100	1.0
SULFURIC ACID	95	>480	ND*	.019
TERT-BUTYL ALCOHOL	100	>480	ND*	0.02
TETRABROMOETHANE	100	>480	ND*	0.02
TETRACHLOROETHYLENE	99	>480	ND*	.081
TETRAFLUOROMETHANE	95+	>480	<0.018	
TETRAHYDROFURAN	100	>480	ND*	.098
TETRALONE	98	>480	ND*	1.00
THIOGLYCOLIC ACID	95+	>480	<0.1	
THIONYL CHLORIDE	99	45	243	1.
TITANIUM TETRACHLORIDE	100	>480	ND*	1.00
TOLUENE	98	>480	<0.1	.031
TOLUENE 1,3-DIISOCYANATE	95+	>480	<0.01	
TOLUENE DIISOCYANATE	95+	>480	<0.5	
TOLUIDINE O-	95+	>480	<0.001	
TRIBROMOPHENOL 2,4,6-	99	<15	4.93	1.
TRICHLORASILANE	98	>480	<0.1	1.0
TRICHLOROBENZENE	95+	>480	<0.01	
TRICHLOROETHANE 1,1,1-	99	>480	ND*	.30
TRICHLOROETHYLENE	95+	>480	<0.1	
TRIETHOXYSILANE	95	>480	ND*	.01
TRIETHYLAMINE	99	>480	ND*	.13
TRIFLUOROACETIC ACID	95+	>480	<0.1	
TRIFLUOROACETYL CHLORIDE	98	>480	ND*	1.00
TRIFLUOROMETHANE	95+	>480	<0.014	
TRIMETHYLPHOSPHITE	97	>480	ND*	0.11
TRIPHENYL PHOSPHITE	99	>480	ND*	1.00

TUNGSTEN HEXAFLUORIDE	100	>480	ND*	0.20
TURPENTINE	MIXTURE	>480	ND*	.01
UNLEADED GASOLINE	95+	>480	<0.001	
VINYL ACETATE	95+	>180	ND*	.01
VINYL CHLORIDE	100	>480	ND*	0.20
VINYLIDENE CHLORIDE	95+	>180	ND*	.03
XYLENES	UNK	>180	ND*	.036