**Supplementary Material**

**Table S.2. Reactivity Ratios for monomer pairs** (Greenley, 1999*a*;Chougrani et al., 2008)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No.** | **Monomer 1** | Monomer 2 | ***r*1** | ***r*2** |
| 1a | Acetylene, phenyl- | Isoprene | 0.1 | 3.01 |
| 2 | Acetylene, phenyl- | Methacrylate, butyl | 0.21 | 1.7 |
| 3 | Aconitate, trimethyl | Vinyl chloride | 0.19 | 0.04 |
| 4 | Acetylene, phenyl- | Methacrylate, methyl | 0.2 | 1.5 |
| 5 a | Acrolein | Styrene | 0.32 | 0.205 |
| 6 | Acrolein, methyl- | Acrylate, butyl | 2.5 | 0.02 |
| 7 | Acrylamide | Succinimide, N-vinyl- | 1.86 | 0.17 |
| 8 | Acrylamide, N-methylol- | Acrylate, methyl | 1.9 | 1.3 |
| 9 a | Acrylamide, N-octadecyl- | Vinylidene chloride | 1.4 | 0.432 |
| 10 | Acrylamide,N,N-diethyl | Styrene | 0.39 | 1.23 |
| 11 | Acrylate, a-acetoxy-, ethyl | Acrylate, a-chloro-, ethyl | 0.3 | 1.71 |
| 12 | Acrylate, a-acetoxy-, ethyl | Acrylate, ethyl | 0.968 | 0.943 |
| 13 a | Acrylate, a-acetoxy-, ethyl | Methacrylate, methyl | 0.608 | 1.65 |
| 14 | Acrylate, a-acetoxy-, ethyl | Styrene | 0.173 | 0.557 |
| 15 | Acrylate, a-chloro-, ethyl | Methacrylonitrile | 2.0 | 0.45 |
| 16 | Acrylate, butyl | Acrylamide, N-methylol- | 0.87 | 0.61 |
| 17 a | Acrylate, butyl | Itaconate, dimethyl | 0.4 | 0.94 |
| 18 | Acrylate, butyl | Methactylate, butyl | 0.3 | 2.2 |
| 19 | Acrylate, butyl | Oxazoline, 2,2-isopropenyl- | 0.24 | 1.4 |
| 20 | Acrylate, butyl | Pyridine, 2-vinyl- | 0.1 | 2.51 |
| 21 a | Acrylate, butyl | Styrene,p-1-(2-hydroxybutyl)- | 0.17 | 0.4 |
| 22 | Acrylate, butyl | Succinimide, N-vinyl- | 1.54 | 0.15 |
| 23 | Acrylate, butyl | Vinyl fluoride | 19 | 0.01 |
| 24 | Acrylate, butyl | Vinyl, p-, benzylethylcarbinol | 0.17 | 0.4 |
| 25 a | Acrylate, glycidyl | Acrylate, 2-ethylhexyl | 1.18 | 1.12 |
| 26 | Acrylate, glycidyl | Acrylonitrile | 1 | 1.01 |
| 27 | Acrylate, heptafluorobutyl | Methacrylate, methyl | 0.177 | 0.084 |
| 28 | Acrylate, octyl | Vinylidene chloride | 0.679 | 0.851 |
| 29 a | Acrylate,2-chloroethyl | Acrylate, ethyl | 1.03 | 0.9 |
| 30 | Acrylate,2-chloroethyl | Acrylate, methyl | 1.07 | 0.9 |
| 31 | Acrylate,2-chloroethyl | Acrylonitrile | 0.87 | 1.03 |
| 32 | Acrylate,2-chloroethyl | Methacrylate, methyl | 0.37 | 2.15 |
| 33 a | Acrylate, 2-ethylhexyl | Vinyl chloride | 4.5 | 0.16 |
| 34 | Acrylate,2-nitrobutyl | Styrene | 0.12 | 0.35 |
| 35 | Acrylic acid | Acrylate, ethyl | 0.91 | 1.02 |
| 36 | Acrylic acid | Methacrylate, isopropyl | 1.03 | 0.68 |
| 37 a | Acrylic acid | Methacrylate, methyl | 1.73 | 0.418 |
| 38 | Acrylic acid | Vinylhydroquinone dibenzoate | 0.44 | 0.95 |
| 39 | Acrylonitrile | Citraconimide, N-methyl- | 0.53 | 0.6 |
| 40 | Acrylonitrile | Methacrylate, 2-bromoethyl | 0.31 | 2.08 |
| 41 a | Acrylonitrile | Methacryloyl chloride | 0.35 | 2.8 |
| 42 | Acrylonitrile | Methacrylonitrile | 0.43 | 1.67 |
| 43 | Acrylonitrile | Oxazoline, 2,-2-isopropenyl-4,4-dimethyl- | 0.24 | 1.83 |
| 44 | Acrylonitrile | Vinyl isothiocyanate | 0.19 | 0.16 |
| 45 a | Acrylonitrile | Vinyl phenyl ether | 2.5 | 0.23 |
| 46 | Acrylonitrile | Vinyl-tris(trimethoxysiloxy)silane | 3.875 | 0.075 |
| 47 | Acryloyl chloride | Acrylate, methyl | 2.3 | 0.34 |
| 48 | Acryloyl chloride | Methacrylate, 2-hydroxypropyl | 0.29 | 1.79 |
| 49 a | Acryloyl chloride | Vinylidene chloride | 1.12 | 0.5 |
| 50 | Allyl acrylate | Acrylate, methyl | 0.33 | 0.52 |
| 51 | Allyl chloride | Vinyl Benzoate | 0.88 | 0.46 |
| 52 | Allyl chloride | Vinyl formate | 0.78 | 0.57 |
| 53 a | Allyl chloride | Vinyl propionate | 0.68 | 0.62 |
| 54 | Butadiene | Fumarate, diethyl | 2.13 | 0.25 |
| 55 | Butadiene | Styrene, p-chloromethyl- | 0.87 | 0.42 |
| 56 | Butadiene, 2,3-dimethyl- | Isoprene | 0.84 | 1.18 |
| 57 a | Butadiene, hexafluoro- | Isoprene | 0.78 | 1.19 |
| 58 | Butadiene, 2-chloro- | Butadiene, 2-fluoro | 3.7 | 0.22 |
| 59 | Butadiene, 2-chloro- | Quinoline, 2-vinyl- | 2.1 | 0.38 |
| 60 | Butadiene, 2-fluoro | Butadiene, hexafluoro- | 2.93 | 0.24 |
| 61 a | Carbamate, N-vinyl-, ethyl | Acrylic acid | 0.26 | 4.69 |
| 62 | Carbazole, N-vinyl- | Acrylate, ethyl | 0.27 | 1.1 |
| 63 | Carbazole, N-vinyl- | Vinyl formate | 4.142 | 0.192 |
| 64 | Carbon Monoxide | Vinyl acetate | 0.33 | 0.24 |
| 65 a | Citraconimide,N-methyl- | Styrene | 0.24 | 0.15 |
| 66 | Diallyl phthalate | Fumarate, diethyl | 0.01 | 1.25 |
| 67 | Diallyl phthalate | Vinyl chloride | 0.7 | 0.833 |
| 68 | Diallycyanamide | Vinyl chloride | 0.68 | 0.44 |
| 69 a | Ethylene | Vinyl butyrate | 0.7 | 1.5 |
| 70 | Ethylene-1, 1-diphenyl- | Acrylate, ethyl | 0.5 | 0.8 |
| 71 | Ethylene,chlorotrifluoro- | Vinyl propionate | 0.08 | 0.63 |
| 72 | Ethylene,chlorotrifluoro- | Vinyl fluoride | 1.2 | 0.8 |
| 73 a | Hexatriene, tetrachloro | Isoprene | 1.58 | 0.58 |
| 74 | Hexatriene, tetrachloro | Butadiene, 2-chloro | 0.2 | 3.6 |
| 75 | Imidazole, 1-vinyl-2-methyl- | Acrylate, methyl | 0.05 | 1.28 |
| 76 | Isobutylene | Maleic anhydride | 0.012 | 0.065 |
| 77 a | Isoprene | Pyridine, 2-vinyl-\* | 0.585 | 0.465 |
| 78 | Isoprene | Quinoline, 2-vinyl | 1.88 | 0.53 |
| 79 | Isoprene | Styrene | 1.98 | 0.44 |
| 80 | Isoprene, 3-acetoxy- | Methacrylate, methyl | 2.81 | 0.16 |
| 81 a | Isopropenyl acetate | Vinyl acetate | 1.082 | 1.171 |
| 82 | Isopropenyl, 3-( 1-cyclohexenyl), acetate | Styrene | 0.56 | 1.59 |
| 83 | Isopropenyl, 3-( 1-cyclohexenyl), acetate | Acrylate, methyl | 0.57 | 0.37 |
| 84 | Isopropenylisocyanate | Acrylate, ethyl | 0.15 | 0.79 |
| 85 a | Isopropenylisocyanate | Methacrylate, methyl | 0.14 | 3.1 |
| 86 | Isopropenylisocyanate | Vinyl chloride | 3 | 0.39 |
| 87 | Itaconate, dibutyl | Itaconate, dimethyl | 1.1 | 1.1 |
| 88 | Itaconate, diethyl | Pyridine, 2-methyl-5-vinyl- | 0.17 | 0.51 |
| 89 a | Itaconate, diethyl | Vinyl chloride | 5.65 | 0.06 |
| 90 | Itaconate, dimethyl | Methacrylonitrile | 0.28 | 1.26 |
| 91 | Itaconate, dimethyl | Styrene, p-chloro- | 0.15 | 0.69 |
| 92 | Maleate, diethyl | Butadiene | 0.11 | 8.08 |
| 93 a | Maleic anhydride | Styrene,a-methyl- | 0.08 | 0.04 |
| 94 | Maleimide, 2,3-dimethyl-N-(2-methacryloxyethyl)- | Methacrylic acid | 1.33 | 0.746 |
| 95 | Maleimide, N-(2-chlorophenyl)- | Acrylonitrile | 1.078 | 0.956 |
| 96 | Maleimide, N-(4-chlorophenyl)- | Acrylonitrile | 0.743 | 0.972 |
| 97a | Methacrylate, 2,2,6,6-tetra-methyl-4-piperidinyl | Styrene | 0.3 | 0.63 |
| 98 | Methacrylate, 2,2,6,6-tetra-methyl-4-piperidinyl | Vinyl methyl ketone | 0.53 | 0.41 |
| 99 | Methacrylate, 2,3-epithio-propyl | Methacrylate, glycidyl | 0.78 | 0.81 |
| 100 | Methacrylate, 2,3-epithio-propyl | Methacrylate, methyl | 0.97 | 0.83 |
| 101a | Methacrylate, 2,3-epithio-propyl | Styrene | 0.28 | 0.41 |
| 102 | Methacrylate, 2-bromoethyl | Acrylate, ethyl | 2.7 | 0.37 |
| 103 | Methacrylate, 2-bromoethyl | Styrene | 0.41 | 0.32 |
| 104 | Methacrylate, 2-chloroethyl | Methacrylate, butyl | 0.82 | 1.086 |
| 105a | Methacrylate, 2-hydroxyethyl | Methacrylate, 2-acetoxyethyl | 1.02 | 0.99 |
| 106 | Methacrylate, 2-naphthyl | Styrene | 0.534 | 0.56 |
| 107 | Methacrylate, 2-(sulfonic acid)ethyl | Styrene | 0.6 | 0.37 |
| 108 | Methacrylate, 2-(sulfonic acid)ethyl | Vinylidene chloride | 3.6 | 0.22 |
| 109a | Methacrylate, benzyl | Methacrylate, 2-chloroethyl | 1.068 | 0.989 |
| 110 | Methacrylate, benzyl | Methacrylate, phenyl | 0.67 | 1.42 |
| 111 | Methacrylate, benzyl | Vinylidene chloride | 3.3 | 0.34 |
| 112 | Methacrylate, butyl | Methacrylate, glycidyl | 0.85 | 0.94 |
| 113a | Methacrylate, butyl | Styrene, p-chloromethyl- | 0.38 | 1.46 |
| 114 | Methacrylate, ethyl | Methacrylate, 2-hydroxypropyl | 0.267 | 1.844 |
| 115 | Methacrylate, ethyl | Methacrylic acid | 0.71 | 0.57 |
| 116 | Methacrylate, ethyl | Styrene, p-chloromethyl- | 0.36 | 1.29 |
| 117a | Methacrylate, glycidyl | Vinyl phenyl ketone | 0.719 | 0.697 |
| 118 | Methacrylate, isobutyl | Acetylene, phenyl- | 1.9 | 0.27 |
| 119 | Methacrylate, isobutyl | Acrylic acid | 0.68 | 1.03 |
| 120 | Methacrylate, methyl | Silane y-metaacryloxypropyl-trimethoxy | 0.788 | 2.06 |
| 121a | Methacrylate, methyl | Styrene, m-bromo- | 0.48 | 1.17 |
| 122 | Methacrylate, methyl | Styrene,m-methyl- | 0.512 | 0.486 |
| 123 | Methacrylate, methyl | Vinyl 4chlorocyclohexyl ketone | 0.77 | 0.51 |
| 124 | Methacrylate, methyl | Tetrazole, 2-methyl-5-vinyl- | 1.026 | 0.486 |
| 125a | Methacrylate, methyl | Vinylferrocene | 1.22 | 0.52 |
| 126 | Methacrylic acid | Phosphonate, vinyl-, diethyl | 1.9 | 0.15 |
| 127 | Methacrylic acid | Pyridine, 2-methyl-5-vinyl- | 0.43 | 0.85 |
| 128 | Methacrylic acid | Vinylidene chloride | 3.368 | 0.154 |
| 129a | Methacrylic anhydride | Acrylate, methyl | 4.15 | 0.16 |
| 130 | Methacrylonitrile | Acrolein | 1.185 | 0.7 |
| 131 | Methacrylonitrile | Vinyl cinnamate | 4.6 | 0.15 |
| 132 | Norbornadiene | Vinyl acetate | 1.354 | 0.818 |
| 133a | Norbornadiene | Vinyl chloride | 0.41 | 0.67 |
| 134 | Oxazoline, 2-isopropenyl-2- | Acrylate, butyl | 1.4 | 0.24 |
| 135 | Oxazoline, 2-isopropenyl-2- | Styrene | 0.64 | 0.67 |
| 136 | Oxazoline, 2,-2-isopropenyl-4,4-dimethyl- | Acrylate, methyl | 1.3 | 0.46 |
| 137a | Oxazoline, 2,-2-isopropenyl-4,4-dimethyl- | Styrene | 0.68 | 0.55 |
| 138 | Oxazoline, 2-,4-acryloxymethyl-2,4-dimethyl- | Methacrylate, methyl | 0.11 | 0.41 |
| 139 | Pentadiene, trans-1,3- | Butadiene | 0.09 | 1.22 |
| 140 | Phosphonate, isopropenyl-, dimethyl | Methacrylate, methyl | 0.2 | 30 |
| 141a | Phosphonate, vinyl-, diethyl | Phosphonate, a-carbomethoxyvinyl-, diethyl | 0.62 | 0.55 |
| 142 | Silane,y-methacryloxypropyltrimethoxy- | Styrene | 0.868 | 0.425 |
| 143 | Tetrazole, l-vinyl- | Styrene | 0.184 | 3.85 |
| 144 | Tetrazole, 2-methyl-5-(4’-vinyl)phenyl- | Acrylonitrile | 1.1 | 0.42 |
| 145a | Tetrazole, 2-methyl-5-(4’-vinyl)phenyl- | Styrene | 1.3 | 0.65 |
| 146 | Tetrazole, 2-methyl-5-(4’-vinyl)phenyl- | Vinylidene chloride | 1.9 | 0.13 |
| 147 | Triallyl citrate | Vinyl chloride | 0.605 | 1.33 |
| 148 | Vinyl dodecyl ether | Vinyl chloride | 0.15 | 1.93 |
| 149a | Vinyl hendecanoate | Vinyl chloride | 0.38 | 1.022 |
| 150 | Vinyl laurate | Vinyl acetate | 0.7 | 1.4 |
| 151 | Vinyl-m-cresyl ether | Methacrylate, methyl | 0.2 | 3.3 |
| 152 | Vinyl-m-cresyl ether | Vinylidene chloride | 0.04 | 1.95 |
| 153a | Vinyl o-cresyl ether | Vinyl chloride | 0.14 | 1.33 |
| 154 | Vinyl propionate | Ethylene | 1.5 | 0.67 |
| 155 | p-Vinylbenzoic acid | Styrene | 1.029 | 0.282 |
| 156 | Vinyl Methyl Ketone | Vinyl phenyl ketone | 0.74 | 0.671 |
| 157a | ethyl N,N-tetramethylbis(phosphonate)-bis(methylene) amine methylmethacrylate71 | Fumarate, diethyle | 1.1 | 0.77 |
| 158 | propyl N,N-tetramethylbis(phosphonate)-bis(methylene) amine methylmethacrylate71 | Methyl methacrylate | 1.2 | 0.8 |
| 159 | pentyl N,N-tetramethylbis(phosphonate)-bis(methylene) amine methylmethacrylate71 | Methyl methacrylate | 1.13 | 0.65 |
| 160  161a | hexyl N,N-tetramethylbis(phosphonate)-bis(methylene) amine methylmethacrylate71  undecyl N,N-tetramethylbis(phosphonate)-bis(methylene) amine methylmethacrylate71 | Methyl methacrylate  Methyl methacrylate | 1.15  1.32 | 0.79  0.79 |

a test set data