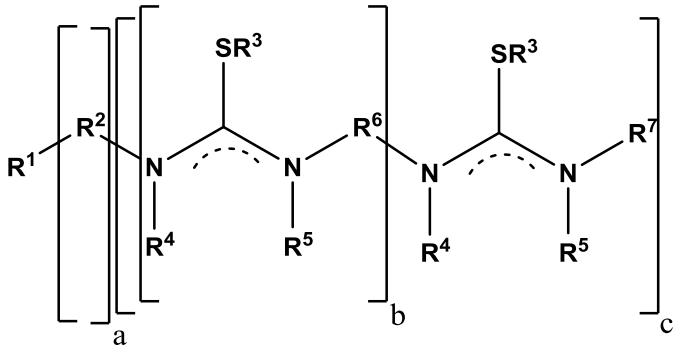
WHAT IS CLAIMED IS:

1. A method of synthesizing carbodiimides comprising:

(a) providing an alkylisothiourea of formula (1) to a reaction mixture;



(1)

where:

R^1 = H; (C_1-C_{40})hydrocarbyl, (C_1-C_{40})heterohydrocarbyl;

R^2 = (C_1-C_{40})hydrocarbyl, (C_1-C_{40})heterohydrocarbyl;

R^3 = H; (C_1-C_{40})hydrocarbyl, (C_1-C_{40})heterohydrocarbyl;

R^4 = H; or absent;

R^5 = H; or absent;

R^6 = (C_1-C_{40})hydrocarbyl, (C_1-C_{40})heterohydrocarbyl;

R^7 = H; (C_1-C_{40})hydrocarbyl, (C_1-C_{40})heterohydrocarbyl;

a is 0 or 1;

b is from 0 to 10; and

c is from 1 to 10.

(b) providing a thiophilic reagent to the reaction mixture and reacting under conditions sufficient to provide the carbodiimide, and wherein the carbodiimide is a polycarbodiimide or a biscarbodiimide.

2. The method of synthesizing carbodiimides of claim 1, wherein the reaction mixture further comprises a solvent selected from the list consisting of acetonitrile, proprionitrile, butyronirile, isobutyronitrile, valeronitrile, hexanenitrile, trimethylacetonitrile, malonitrile, succionitrile, glutaronitrile, adiponitrile, 1,5-dicyanopentane, 1,6-dicyanohexane, N,N-dimethylformamide, N,N-dimethylacetamide, acetone, methylene chloride, 1,2-dichloroethane, chloroform, carbontetrachloride, 1,4-dioxane, benzene, toluene, xylenes,

pentane, hexanes, heptanes, petroleum ether, diethyl ether, tetrahydrofuran, 2-methyltetrahydrofuran, methyl-t-butyl ether, or a mixture thereof.

3. The method of synthesizing carbodiimides of claim 1, wherein the reaction mixture further comprises a base selected from the list consisting of acyclic or cyclic *N*,*N*,*N*-trisubstituted amine including, but not limited to, trimethylamine, triethylamine, N,N-diisopropylethyl amine, *N,N,N',N'*-tetramethylethylenediamine or TMEDA, *N,N,N',N'*-tetramethyl-1,3-propanediamine or TMPDA, *N,N,N',N'*-tetramethyl-1,4-butanediamine or TMBDA, *N,N,N',N'*-tetraethylethylenediamine or TMEEA, *N,N,N',N'*-tetraethyl-1,3-propanediamine or TMPEA, *N,N,N',N'*-tetramethyl-1,5-pentanediamine, *N,N,N',N'*-tetramethyl-1,6-hexanediamine, *N*-ethyldicyclohexylamine, 1,2,2,6,6-pentamethylpiperidine, *N*-methylpiperidine, *N*-ethylpiperidine, *N*-methylpyrrolidine, *N*-ethylpyrrolidine, *N*-methylmorpholine or 4-methylmorpholine, 4-ethylmorpholine, *N,N'*-1,4-dimethylpiperazine, 1,3,5-trimethylhexahydro-1,3,5-triazine, 1,3,5-triethylhexahydro-1,3,5-triazine, 1,3,5-triphenylhexahydro-1,3,5-triazine, 1,3,5-tribenzylhexahydro-1,3,5-triazine, 1,4-diazabicyclo[2.2.2]octane or DABCO, 1-azabicyclo[2.2.2]octane or Quinuclidine, 1,5-diazabicyclo[4.3.0]non-5-ene or DBN, 1,8-diazabicyclo[5.4.0]undec-7-ene or DBU, 7-methyl-1,5,7-triazabicyclo[4.4.0]dec-5-ene or MTBD, 2-t-butyl-1,1,3,3-tetramethylguanidine, *N*,*N*,*N*-triphenylamine, *N*,*N*,*N*-dimethylphenylamine, *N*,*N*,*N*-diphenylmethylamine 1,8-bis(dimethylamino)naphthalene or Proton-Sponge; any heteroaromatic amine including, but not limited to, pyridine, 2,6-lutidine, 2,4-lutidine, 2,6-di-t-butylpyridine, 2,6-di-t-butyl4-methylpyridine, 2,4,6-tri-t-butylpyridine, 2,4,6-tri-tbutylpyrimidine, 4-t-butylpyridine, *N*,*N*-dimethylaminopyridine or DMAP, pyrazine, pyridazine, pyrimidine, s-triazine, phthalazine, quinoline, isoquinoline, quinoxaline, acridine, 3,4-dihydroisoquinoline, 2,2'-bipyridine, 4,4'-bipyridine, 1,10-phenanthroline, neocuproine, 1,7-phenanthroline, 3,4,7,8-tetramethyl-1,10-phenanthroline, 1-methylimidazole, 1-butylimidazole, 1-ethylimidazole, 1-benzylimidazole, 1-octylimidazole, 1-phenylimidazole, 1-methylpyrazole, 1-phenylpyrazole; any Group 1 (alkali) or Group 2 (alkaline) earth metal salts including, but not limited to, lithium bicarbonate, sodium bicarbonate, potassium bicarbonate, rubidium bicarbonate, cesium bicarbonate, francium bicarbonate, beryllium bicarbonate, magnesium bicarbonate, calcium bicarbonate, strontium bicarbonate, barium bicarbonate, radium bicarbonate, lithium carbonate, sodium carbonate,

potassium carbonate, rubidium carbonate, cesium carbonate, francium carbonate, beryllium carbonate, magnesium carbonate, calcium carbonate, strontium carbonate, barium carbonate, radium carbonate, or mixtures thereof.

4. The method of synthesizing carbodiimides of claim 1, wherein the reaction mixture has an operating temperature of from -78 to 50 °C.

5. The method of synthesizing carbodiimides of claim 1, wherein the thiophilic reagent comprises a metal that is not an alkali metal.

6. The method of synthesizing carbodiimides of claim 1, wherein the thiophilic reagent comprises a metal that is a transition metal.

7. The method of synthesizing carbodiimides of claim 1, wherein the thiophilic reagent is selected from the group consisting of a halide, amine, nitrile, triflate, nitrate, acetate, acetylacetonate, carbonate, oxalate, oxide, phosphate, sulfite, or sulfate of copper, zinc, gold, molybdenum, mercury, tungsten, nickel, silver, iron, cobalt, and manganese.

8. The method of synthesizing carbodiimides of claim 1, wherein the thiophilic reagent is selected from the group consisting of a halide, amine, nitrile, triflate, nitrate, acetate, acetylacetonate, carbonate, oxalate, oxide, phosphate, sulfite, or sulfate of silver.

9. The method of synthesizing carbodiimides of claim 1, wherein the thiophilic reagent is silver nitrate.