WHAT IS CLAIMED IS:

1. A composition comprising at least two diisocyanates.

2. The composition of claim 1, wherein the composition comprises at least four diisocyanates.

3. The composition of claim 1, wherein the diisocyanates are selected from the group consisting of alkyl 2,6-diisocyanatohexanoate, alkyl 2,3-diisocyanatopropanoate, alkyl 5-(3-formylguanidino)-2-isocyanatopentanoate, and alkyl 2,4-diisocyanatobutanoate

4. The composition of claim 1, wherein the diisocyanates are selected from the group consisting of methyl 2,6-diisocyanatohexanoate, methyl 2,3-diisocyanatopropanoate, methyl 5-(3-formylguanidino)-2-isocyanatopentanoate, and methyl 2,4-diisocyanatobutanoate.

5. The composition of claim 1, further comprising at least one additive selected from the group consisting of silica, wax, antifoamer, lubricant, plasticizer, softening agent, pigment, biocide, and filler.

6. A method of preparing a mixture of at least two diisocyanates comprising reacting a mixture of diamino alkyl esters with di- or triphosphege.

7. A manufactured material or product comprising a polyurethane, wherein the material or product is a wood-based composite panel, an oriented strand board (OSB), a medium-density fiberboard (MDF), a plywood panel, a flexible foam seating material, a rigid foam insulation panel, a microcellular foam seal, a microcellular foam gasket, a durable elastomeric wheel, a durable elastomeric tire, an automotive suspension bushing, an electrical potting compound, an adhesive, a sealant, a fiber, seal, a gasket, a carpet underlay, or a hard plastic part and the polyurethane comprises at least two polymerized diisocyanates.

8. The manufactured product according to claim 7, wherein the product is an OSB, MDF, or a plywood panel.

9. An oriented strand board (OSB), a medium density fiberboard (MDF) or a plywood panel comprising a polyurethane which comprises at least two polymerized diisocyanates.

What is claimed is:

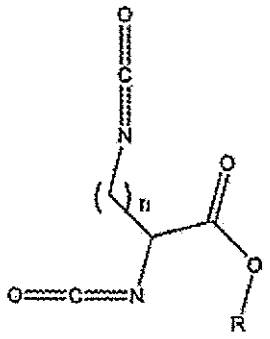
1: A method of preparing a mixture of at least two diisocyanates comprising:

(a) providing a naturally occurring protein source;

(b) processing the naturally occurring protein source to generate a product comprising a biodiesel biofuel and a water/glycerin fraction comprising a mixture of alkyl esters comprising diamino alkyl esters and monofunctionalized alkyl esters;

(c) separating from the water/glycerin fraction the 50% monofunctional alkyl esters to generate a product comprising diamino alkyl esters, and

(d) reacting the separated mixture of diamino alkyl esters of step (c) with an excess of a phosgene to generate a mixture of diisocyanate derivatives of Formula II,



(II)

, R is alkyl, and n = 1 – 4

wherein the reaction to generate a mixture of diisocyanate derivatives from the mixture of diamino alkyl esters comprises conditions of temperatures between about 50 to 200°F and pressures of between 1 to 10 bar.

2. The method of claim 1, wherein the mixture of diamino alkyl esters comprises the diamino alkyl esters of a lysine, an asparagine, an arginine and a glutamine.

3. The method of claim 1, wherein the mixture of diamino alkyl esters comprises a diamino methyl ester.

4. The method of claim 1, wherein the naturally occurring protein source comprises a soy protein source, a corn, a rice bran, an oil seed, an algae, a grain, or a sorghum.

5. The method of claim 1, wherein the separating of the 50% monofunctionalized alkyl esters from the water/glycerin fraction comprises use of an ion exchange or a chromatographic separation.

6. The method of claim 1, wherein the separating of the 50% monofunctionalized alkyl esters from the water/glycerin fraction comprises use of a batch or a continuous mode process.

7. The method of claim 1, wherein at least one of the diisocyanates produced is an alkyl 2,6-diisocyanatohcxanoate, an alkyl 2,3-diisocyanatopropanoate, an alkyl 5 -(3 formylguanidino)-2-isocyanatopentanoate, or an alkyl 2,4-diisocyanatobutanoate.

8. The method of claim 1, wherein at least one of the diisocyanates produced is a methyl 2,6-diisocyanatohexanoate, a methyl 2,3-diisocyanatopropanoate, a methyl 5-(3-formylguanidino)-2-isocyanalopentanoate, or a methyl 2,4-diisocyanatobutanoate.

9. The method of claim 1, wherein the naturally occurring protein source is a soy protein source.

10. The method of claim 1, wherein a product comprising the mixture of diamino alkyl esters is generated by a process comprising reacting a feedstock source with an alcohol under pressure .

11. The method of claim 10, wherein the process comprises reacting the feedstock source with an alcohol and an acid in a pressure reactor system that allows for sufficient temperature to keep the alcohol from boiling in the presence of an acid catalyst.

12. The method of claim 11, wherein the pressure in the pressure reactor system is 20 PSIG over the vapor pressure of the alcohol.

13. The method of claim 12, wherein the mixture of diamino alkyl esters is reacted with an excess of a di-phosgene, a tri-phosgene or both, to generate a mixture of diisocyanate derivatives from the mixture of diamino alkyl esters.