CLAIMS

1. A high functionality macromer which comprises the reaction product of:

(a) a polyisocyanate having an NCO group content of from 10% to 33%, and having a functionality greater than 2, or a mixture thereof, wherein said polyisocyanate is selected from the group consisting of aromatic polyisocyanates, aliphatic polyisocyanates, trimers, dimer/trimer and biurets,

(b) at least one alcohol with reactive unsaturation,

and

(c) a hydroxyl group-containing polyether having an OH number of from 9 to 60 and a functionality of from 1 to 6,

optionally, in the presence of

(d) one or more urethane catalysts.

2. The macromer of Claim 1 in which (a) is selected from the group consisting of aliphatic isocyanates, aromatic isocyanates, and mixtures thereof.

3. The macromer of Claim 1 in which (b) is selected from the group consisting of hydroxyalkyl acrylates, hydroxyalkyl methacrylates, hydroxyaryl acrylates, hydroxyaryl methacrylates, aromatic-substituted ethylenically unsaturated monols, isopropenylphenyl monols, hydroxyl nitriles, and mixtures thereof.

4. The macromer of Claim 1 in which (b) comprises 2-hydroxyethyl methacrylate.

5. The macromer of Claim 1 in which (a) and (b) are reacted before being reacted with (c).

6. A process for the preparation of a high functionality macromer, comprising:

(I) reacting

(a) a polyisocyanate having an NCO group content of 10 to 33%, and having a functionality greater than 2, or a mixture thereof, wherein said polyisocyanate is selected from the group consisting of aromatic polyisocyanates, aliphatic

polyisocyanates, trimers, dimer/trimer and biurets,

(b) at least one alcohol with reactive unsaturation

and

(c) a hydroxyl group-containing polyether having an OH number of from 9 to 60 and a functionality of from 1 to 6,

optionally, in the presence of

(d) one or more urethane catalysts.

7. The process of Claim 6 in comprising reacting (a) and (b) to form a modified polyisocyanate that is subsequently reacted with (c).

8. A preformed stabilizer comprising the free-radical polymerization product of:

(A) the macromer of Claim 1, with

(B) least one ethylenically unsaturated monomer,

formed in the presence of

(C) at least one free-radical polymerization initiator,

and, optionally,

(D) liquid diluent,

and, optionally,

(E) a chain transfer agent.

9. The preformed stabilizer of Claim 8 in which (A) comprises the reaction product of:

(a) a polyisocyanate having an NCO group content of from 10 to 33% with

(b) an alcohol selected from the group consisting of hydroxyalkyl acrylates, hydroxyalkyl methacrylates, hydroxyaryl acrylates, hydroxyaryl methacrylates, aromatic-substituted ethylenically unsaturated monols, isopropenylphenyl monols, hydroxyl nitriles and mixtures thereof;

and

(c) a hydroxyl group-containing polyether having a functionality of from 1 to 6, an OH number of from 9 to 60 and a molecular weight of from 2,000 to 12,000.

10. A process for the preparation of a preformed stabilizer comprising:

(I) free-radically polymerizing:

(A) the ethylenically unsaturated macromer of Claim 1, with

(B) at least one ethylenically unsaturated monomer,

in the presence of

(C) at least one free-radical polymerization initiator,

and, optionally,

(D) a liquid diluent,

and, optionally,

(E) a chain transfer agent.

11. A polymer polyol comprising the reaction product of:

(I) a base polyol having a hydroxyl number of from 20 to 500, a functionality of 2 to 6, and an equivalent weight of from 100 to 3,000,

(II) the preformed stabilizer of Claim 9,

and

(III) at least one ethylenically unsaturated monomer,

in the presence of

(IV) at least one free-radical polymerization initiator,

and, optionally,

(V) a chain transfer agent.

12. The polymer polyol of Claim 11 in which (IV) is selected from the group consisting of acyl peroxides, alkyl peroxides, azo compounds and mixtures thereof.

13. A process for the production of a polymer polyol comprising:

(1) free-radically polymerizing:

(I) a base polyol having a hydroxyl number of from 20 to 500, a functionality of from 2 to 6,

(II) the preformed stabilizer of Claim 9,

and

(III) at least one ethylenically unsaturated monomer,

in the presence of

(IV) at least one free-radical polymerization initiator,

and, optionally,

(V) a chain transfer agent.

14. The process of Claim 13 in which (IV) is selected from the group consisting of acyl peroxides, alkyl peroxides, azo compounds and mixtures thereof.

15. A polymer polyol comprising the reaction product of:

(I) a base polyol having a hydroxyl number of from 20 to 500, a functionality of from 2 to 6,

(II) the macromer of Claim 1,

and

(III) at least one ethylenically unsaturated monomer,

in the presence of:

(IV) at least one free-radical polymerization initiator,

and, optionally,

(V) a chain transfer agent.

16. A process for the production of a polymer polyol comprising:

(1) free-radically polymerizing:

(I) a base polyol having a hydroxyl number of from 20 to 500, a functionality of from 2 to 6,

(II) the macromer of Claim 1,

and

(III) at least one ethylenically unsaturated monomer,

in the presence of:

(IV) at least one free-radical polymerization initiator,

and, optionally,

(V) a chain transfer agent.

17. A process of for the production of a polyurethane comprising reacting (1) a polyisocyanate with (2) an isocyanate-reactive component comprising the polymer

polyol of Claim 15.

18. A process for the production of a polyurethane comprising reacting (1) a polyisocyanate with (2) an isocyanate-reactive component comprising the polymer polyol of Claim 11.

19. The macromer of Claim 1, wherein (a), (b) and (c) are reacted simultaneously.