In an alternative embodiment, some or all of polyol b-1) is pre-reacted with the organic polyisocyanate to form a prepolymer or quasi-prepolymer, which contains isocyanate groups. The prepolymer or quasi-prepolymer may have an isocyanate content of for example, 1 to 20 percent by weight. The isoqyanate content in some embodiments is at least 2.5% or at least 4% and up to 15%, up to 12% or up to 10%. In a final curing step, the prepolymer or quasi-prepolymer is reacted with polyol b-2) and any remaining portion of polyol b-1) at an isocyanate index of 90 to 150 to produce the polyurethane. As before, the isocyanate index may be at least 96 or at least 98 and may be at most 136, at most 110, at most 105 or at most 102.

In yet another alternative embodiment, some or all of polyol b-2) is pre-reacted with the organic polyisocyanate to form a "hard segment" prepolymer or quasi-prepolymer that contains isocyanate groups. The hard-segment prepolymer or quasi-prepolymer may have an isocyanate content of for example, 5 to 30 percent by weight. The isocyanate content of such a hard segment prepolymer in some embodiments is at least 7.5% or at least 10% and up to 26%, up to 22% or up to 20%. In a final step, the hard segment prepolymer or quasi-prepolymer is reacted with polyol b-1) and any remaining portion of polyol b-2) at an isocyanate index of 90 to 150 to produce the polyurethane. Isocyanate index in the final curing step is as described with regard to the previous embodiments.

It is also possible, in a prepolymer process, to form the prepolymer by reacting the organic isocyanate with a mixture of polyols b-1) and b-2) followed by a final curing step in which the resulting prepolymer is reacted with remaining polyol b-1) and/or b-2) to form the polyurethane. Isocyanate index in the final curing step is as described with regard to the previous embodiments.

In any of the foregoing processes, the proportions of reactants are selected such that the polyurethane has a hard segment content of 20 to 80% by weight. The hard segment content is calculated as:

$$H.S.Content = 100\% \times \frac{Wt_{iso} + Wt_{ce}}{Wt_{reactants}}$$

where Wt_{iso} is the weight of the starting polyisocyanate compounds; Wt_{ce} is the weight of all starting isocyanate-reactive compounds (including polyol b-2) that have equivalent weights per isocyanate-reactive group of 250 or below, and $Wt_{reactants}$ is the total combined weight of all starting polyisoqyanate compounds and all isocyanate-reactive compounds. In some embodiments, the hard segment