Claims:

1. A polymerization process comprising: A) polymerizing one or more monomers in the presence of a solvent, to form a polymer solution; B) transferring the polymer solution to a liquid-liquid separator, without adding heat to the solution, and wherein a pressure of the polymer solution is actively reduced in a controlled manner prior to, or within, the liquid-liquid separator, to induce at least two liquid phases, a polymer-rich phase and a solvent-rich phase, and wherein a concentration of polymer in the polymer-rich phase is higher than that in the polymer solution transferred to the liquid-liquid separator; and C) detecting an interface between the polymer-rich phase and the solvent-rich phase by use of two sonic transponders positioned within the liquid-liquid separator; such that a first sonic transponder is located in a top half of the liquid-liquid separator and a second sonic transponder is located in a bottom half of the liquid-liquid separator; and D) removing the solvent-rich phase from the liquid-liquid separator and the removed solvent-rich phase comprises less than 1000 ppm polymer.

2. The polymerization process according to claim 1, wherein step (A) occurs in a solution polymerization reactor.

3. The polymerization process according to claim 1, wherein step (A) occurs in a continuously stirred tank reactor.

4. The polymerization process according to claim 1, further comprising calculating a vertical position of the interface face from a reflected sonic signal received by the first or second sonic transponder.

5. The polymerization process according to claim 1, further comprising adjusting a flow rate of removing the solvent-rich phase based upon the vertical position of the interface.