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(54) Title: VINYL AROMATIC POLYMER COUPLING AND FOAMS

(57) Abstract

The invention includes a process comprising steps of (1) forming an admixture of (a) a vinyl aromatic polymer and (b) a coupling amount of at least one poly(sulfonyl azide); (2) introducing the vinyl aromatic polymer or admixture into a melt processing device; (3) melting the vinyl aromatic polymer or admixture, and thereafter (4) exposing the admixture to a temperature, hereinafter, melt process temperature, sufficient to result in coupling of the vinyl aromatic polymer. The invention also includes a process of increasing the molecular weight of a vinyl aromatic polymer by heating an admixture of at least one vinyl aromatic polymer and a coupling amount of at least one poly(sulfonyl azide). Alternatively the invention is a process comprising steps of (1) forming, under a first pressure, a mixture of a vinyl aromatic polymer, a blowing agent and at least one poly(sulfonyl azide), with the mixture at a temperature at which the viscosity of the mixture is sufficient to retain the blowing agent when the mixture is allowed to expand; (2) extruding the mixture into a holding zone maintained at a temperature and second pressure which does not allow the mixture to foam, the holding zone having an outlet die defining an orifice opening into a zone of a third pressure lower than the first or second pressures at which the mixture foams, and an openable gate closing the die orifice; (3) periodically opening the gate; (4) substantially concurrently applying mechanical pressure by a movable ram on the mixture to eject the mixture from the holding zone through the die orifice into the zone of third pressure, at a rate greater than that at which substantial foaming in the die orifice occurs and less than that at which substantial irregularities in cross–sectional area or shape occurs; and (5) permitting the ejected mixture to expand unrestrained in at least one dimension to produce an elongated thermoplastic cellular body. The invention also includes any composition comprising a product formed by a process of the invention, said composition preferably comprising a foam or polymer and any article formed from such a composition.