

ABSTRACT OF THE DISCLOSURE

CONTINUOUS PRODUCTION OF REDUCED GEL CONTENT HYDROXYLATED
ADDITION POLYMERS

A process is disclosed for the continuous production, with reduced gel formation, of free radical addition polymers from ethylenically unsaturated monomers containing at least one free hydroxyl group such as 2-hydroxyethyl methacrylate, from about 0 to about 5% by weight of an alpha-beta unsaturated carboxylic acid such as acrylic acid or methacrylic acid, and the remainder of the monomers used are free radical addition copolymerizable compounds such as styrene, methyl methacrylate and butyl acrylate. The free radical addition polymerization is conducted at from about 150°C to about 310°C under superatmospheric pressure in the presence of one or more solvents. The solvent or the volume average of the solvent mixture has an overall calculated root mean square value of the hydrogen bonding and polar contributions of each solvent's solubility parameters in the range of from about 6 to about 15. The solvent or solvents in total have sufficient volatility under the conditions being used to conduct the polymerization such that any liquid condensate of vapor mixture forming on interior surfaces of the reactor equipment located above the surface of the monomer reactants contains at least 50 mole percent of the solvent to reduce gel formation on such interior surfaces. The process permits the continuous polymerization of the polymers over extended periods of time with reduced formation of gel particles and gel deposits.

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