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(54) Title: FRACTIONATION OF RESINS USING A STATIC MIXER AND A LIQUID-LIQUID CENTRIFUGE

(57) Abstract: Disclosed is a method for producing low molecular weight oligomers of a film forming resin, which involves: a) providing a solution of the film forming resin in a first solvent system comprising a photoresist solvent, and optionally a water-soluble organic solvent; b) providing a second solvent system comprising at least one substantially pure C₅-C₈ alkane and/or at least one aromatic compound having at least one hydrocarbyl substituent and/or water/C₁-C₄ alcohol mixture; and performing steps c)-e) in the following order: c) mixing the solutions from a) and second solvent system from b) in a static mixer for a time period sufficient for efficient mixing; d) feeding the mixture from c) and second solvent system from b) through two separate inlet ports into a liquid/liquid centrifuge, one of the inlet ports feeding the mixture from c), the second inlet port feeding the second solvent system from b) into said liquid/liquid centrifuge at a feed ratio of the mixture from c) to the second solvent system from b) of from about 10/90 to about 90/10, at a temperature of from about 0 °C up to maximum temperature that is less than the boiling point of the lowest boiling solvent in the first or second solvent system; e) rotating the mixture from step d) inside the liquid/liquid centrifuge at a rotational speed sufficient to separate the mixture from step d) into two separate phases, and then collecting the two separate phases, each from two separate outlet ports, into two separate containers, wherein the heavier phase (H) comprises a fractionated film forming resin comprising higher molecular weight fractions of the film forming resin and the lighter phase (L) comprises low molecular weight oligomers of the film forming resin. The present invention also provides a method for producing a photoresist composition, and method for producing a microelectronic device using the aforementioned fractionated resin or low molecular weight oligomers of the film forming resin.



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