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(54) Title: HIGH USE TEMPERATURE NANOCOMPOSITIE RESINS

(57) Abstract: A method of using olefin containing nanostructured chemicals and silanol containing nanostructured chemicals as high temperature resins is described. Vinyl containing nanostructured chemicals are particularly effective in thermosets as they control the motions of polymer chains, and segments, at the molecular level. Silanol containing nanostructured chemicals are particularly effective in thermosets containing polar groups as the silanol can enhance the reactivity of these groups. Because of their tailorable compatibility with fluorinated polymers, nanostructured chemicals can be readily and selectively incorporated into polymers by direct blending and polymerization processes. The incorporation of a nanostructured chemical into a polymer favorably impacts a multitude of polymer physical properties. Properties most favorably improved, are heat distortion and flammability characteristics, permeability, optical properties, texture, feel and durability. Other properties improved include time dependent mechanical and thermal properties such as creep, compression set, shrinkage, modulus, and hardness. In addition to mechanical properties, other physical properties are favorably improved, including lower thermal conductivity, and gas oxygen permeability. These improved properties may be useful in a number of applications, including composite materials, foams, cosmetics, and durable coatings.

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