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(54) Title: POLYHEDRAL OLIGOMERIC SILSESQUIOXANES AND METALLIZED POLYHEDRAL OLIGOMERIC SILSESQUIOXANES AS COATINGS, COMPOSITES AND ADDITIVES

(57) Abstract: A method of using metallized and nonmetallized nanoscopic silicon containing agents for physical property control, radiation absorption, and in situ formation of nanoscopic glass layers on material surfaces. Because of their tailorable compatibility with polymers, metals, composites, ceramics, glasses and biological materials, nanoscopic silicon containing agents can be readily and selectively incorporated into materials at the nanometer level by direct mixing processes. Properties improved include gas and liquid barrier, stain resistance, resistance to environmental degradation, radiation absorption, adhesion, printability, time dependent mechanical and thermal properties such as heat distortion, creep, compression set, shrinkage, modulus, hardness and abrasion resistance, electrical and thermal conductivity, and fire resistance. The materials use useful in a number of applications, including beverage and food packaging, space-survivable materials, microelectronic packaging, and radiation absorptive paints and coatings.



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