

Dielectric Polymer Nanocomposites

[DOWNLOAD HERE](#)

1; Dielectric Polymer Nanocomposites ; 1 1.1; 1 Background, Principles and Promise of Nanodielectrics; 10
1.1.1; 1.1 An Introductory Perspective of Electrical Insulation; 10 1.1.1.1; 1.1.1 The Emergence of
Nanocomposites; 11 1.1.1.2; 1.1.2 Multifunctionality; 12 1.1.1.3; 1.1.3 A Philosophical Perspective; 13
1.1.2; 1.2 The Compounding of Dielectric Nanocomposites; 16 1.1.2.1; 1.2.1 The Importance and
Assessment of Dispersion; 17 1.1.2.2; 1.2.2 Functionalization; 20 1.1.3; 1.3 Property Modifications; 23
1.1.3.1; 1.3.1 Property Augmentation of Practical Significance; 23 1.1.3.2; 1.3.2 Property Characterization
for Diagnostic Purposes; 27 1.1.3.2.1; 1.3.2.1 Dielectric Spectroscopy; 28 1.1.3.2.2; 1.3.2.2 Internal Space
Charge Characteristics; 30 1.1.3.2.3; 1.3.2.3 Dielectric Absorption; 30 1.1.3.2.4; 1.3.2.4 Thermally
Stimulated Currents; 33 1.1.3.2.5; 1.3.2.5 Electroluminescence; 34 1.1.4; 1.4 Other Issues; 35
1.1.5; References; 36 1.2; 2 The Processing of Nanocomposites; 40 1.2.1; 2.1 Introduction to Nanofillers; 40
1.2.1.1; 2.1.1 Classification of the Fillers; 40 1.2.1.2; 2.1.2 Surface Filler Treatment; 45 1.2.2; 2.2
Classification of the Processing of Nanocomposites; 49 1.2.2.1; 2.2.1 In Situ Polymerization Process; 49
1.2.2.1.1; 2.2.1.1 Thermoplastic Materials; 50 1.2.2.1.2; 2.2.1.2 Thermosetting Materials; 51 1.2.2.2; 2.2.2
Solvent Method; 53 1.2.2.3; 2.2.3 Melt Blending; 54 1.2.2.4; 2.2.4 Sol--Gel Process; 56 1.2.3; 2.3 Effects of
Contaminants; 57 1.2.3.1; 2.3.1 Effect of By-Products of a Compatibilization Process; 57 1.2.3.2; 2.3.2
Effect of Moisture; 61 1.2.4; 2.4 The Assessment of Dispersion and Morphological Characterization; 67
1.2.5; References; 69 1.3; 3 Special Considerations for Clay-Based Materials; 74 1.3.1; 3.1 The Nature of
Clay Composites; 74 1.3.1.1; 3.1.1 Structure and Properties of Clay; 74 1.3.1.2; 3.1.2 Characteristics of
Clay Nanocomposites; 75 1.3.1.3; 3.1.3 Effects of Clay Dispersion on Polymer Properties; 76
1.3.1.3.1; 3.1.3.1 Mechanical Properties; 77 1.3.1.3.2; 3.1.3.2 Thermal Properties; 77 1.3.1.3.3; 3.1.3.3
Electrical Insulation (Partial Discharge Resistance); 78 1.3.1.3.4; 3.1.3.4 Electrical Insulation (Insulation
Breakdown Time); 79 1.3.1.3.5; 3.1.3.5 Gas Barrier; 80 1.3.1.3.6; 3.1.3.6 Flame Resistance; 80 1.3.2; 3.2
Intercalation and Exfoliation; 82 1.3.2.1; 3.2.1 Preparation Methods of Clay Nanocomposites; 82
1.3.2.2; 3.2.2 Improved Methods for Manufacturing Epoxy-Based Clay Nanocomposites; 84 1.3.3; 3.3
Chemical Treatments and Organic Modification; 85 1.3.3.1; 3.3.1 Organic Modifier of Clays and

Modification Method;86 1.3.3.2;3.3.2 Confirming Organic Modification of Clays;89 1.3.3.3;3.3.3 Factors in the Intercalation Process;91 1.3.4;3.4 Compounding of Layered Silicate Nanocomposites;91 1.3.4.1;3.4.1 Factors in the Exfoliation Process;92 1.3.4.2;3.4.2 Rheological Characteristics of Polymer Containing Clays;95 1.3.4.3;3.4.3 Manufacture of Nanocomposite Using Unmodified Clays;97 1.3.5;3.5 In Situ Polymerization;97 1.3.5.1;3.5.1 Manufacture and Properties of Polyamide-Based Clay Nanocomposite;98 1.3.5.2;3.5.2 Manufacture and Properties of Epoxy-Based Clay Nanocomposite;99 1.3.6;3.6 Summary;100 1.3.7;References;101 1.4;4 The Chemistry and Physics of the Interface Region and Functionalization;103 1.4.1;4.1 Introduction;103 1.4.1.1;4.1.1 Characterization;104 1.4.2;4.2 The Physical and Chemical Structure of Polymers;104 1.4.2.1;4.2.1 Key Physical and Chemical Properties of Polymers Used for Polymer Nanocomposites;104 1.4.2.2;4.2.2 Comparison of Polymers and Rubbers for Use in Nanocomposites and Their Role in the Interface Region;107 1.4.3;4.3 Morphology, Glass Transition and Free Volume of Polymers;108 1.4.4;4.4 Nanoparticles;109 1.4.4.1;4.4.1 Spherical Inorganic Particles;109 1.4.4.2;4.4.2 Colloidal Spherical Particles;111 1.4.4.3;4.4.3 Intercalated and Exfoliated Nanoparticles;112 1.4.4.4;4.4.4 Other Nanoparticle Structures;115 1.4.4.5;4.4.5 Bonding in Nanoparticles;116 1.4.5;4.5 The Surface Chemistry of Nanoparticles and EAN/ISBN : 9781441915917 Publisher(s): Springer, Berlin, Springer US Format: ePub/PDF Author(s): Nelson, J. K.

[DOWNLOAD HERE](#)

Similar manuals:

[Dielectric Polymer Nanocomposites](#)