Parameter Characteristics of Thermally Treated Viscose Fibers

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Abstract:
This article sheds light on some structural changes in thermally treated viscose fibers at a constant temperature of 100 +/- 1 degrees C at different time periods. The obtained optical parameters were used to calculate the crystallinity, density, Herman's orientation function, average orientation, and form birefringence. In addition, the stress optical coefficients, thermal stress, molar refractivity, specific refractivity, and polarizabilities along and across the axis and segment anisotropy were obtained. Measurements of the refractive indices helped us to calculate the dielectric constant, dielectric susceptibility, surface reflectivity, and transparency transmittances. The mechanisms of structural variation for the viscose fibers due to the annealing process were examined with the structural details for optothermal parameters. The relationships between the measured and calculated parameters are given in illustrations and curves. (C) 2010 Wiley Periodicals, Inc. J Appl Polym Sci 118: 1306-1312, 2010

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Characterization, electrical and magnetic properties of PVA films filled with FeCl3-MnCl2 mixed fillers

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Abstract:
Polyvinyl alcohol (PVA) films filled with different filling levels (FLs) of XFeCL3(15-X) MnCl2 were studied. The DSC thermograms exhibited an increase in the melting temperature with. lling, indicating better thermal stability of the filled polymer of interesting industrial applications. The amorphous feature of the filled polymer was depicted using XRD scans. Vibrational studies displayed significant structural deformations. The FL dependence of certain IR absorption peaks was discussed. The dc electrical conduction mechanism was interpreted on the basis of the modified interpolaron hopping model. The present results of the dc magnetic susceptibility (chi) suggested the temperature dependence of Curie-Weiss behavior characterized by localized magnetic moments. The effective paramagnetic moment (mu(eff)) was estimated; its dependence on the FL exhibited a non-linear character. The electron spin resonance (ESR) study revealed unresolved broad distorted signals characterized by the hyperfine structure. The ESR parameters were evaluated. A correlation between the above-mentioned studies was discussed to relate the structural, electrical and magnetic properties of the filled PVA polymer. (C) 2008 Elsevier B.V. All rights reserved.

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Effect of AgNO3-MnCl2 mixed fillers on the physical properties of polystyrene films

Author(s): Tawansi, A (Tawansi, A); El-Khodary, A (El-Khodary, A); Oraby, AH (Oraby, AH); Youssef, AE (Youssef, AE)

Source: JOURNAL OF APPLIED POLYMER SCIENCE Volume: 95 Issue: 6 Pages: 1333-1341 DOI: 10.1002/app.21119 Published: MAR 15 2005

Abstract: This study deals with the effects of various filling levels of a mixture of two transition compounds [(X)AgNO3(10 - X)MnCl2] on the structural, electrical, and magnetic properties of atactic polystyrene (PS) films. X-ray diffraction (XRD) scans showed two main peaks for unfilled PS films. Crystalline peaks were unexpectedly detected With the filling and could be correlated to the formation of clusters. The IR transmission spectra revealed characteristic PS peaks. Certain IR peaks could be taken as evidence for the formation of polaron and bipolaron bound states in the polymeric matrix. The direct-current (DC) electrical conduction measurements suggested that the conduction mechanism could be attributed to phonon-assisted charge carrier hopping according to the interpolaron hopping model. The DC magnetic susceptibility results at 90-235 K obeyed the Curie-Weiss law. The negative values of the paramagnetic Curie temperature (theta(P)) indicated the possibility of an antiferromagnetic exchange interaction, whereas the positive values of theta(P) suggested a ferromagnetic exchange interaction at low temperatures. An electron spin resonance (ESR) spectrum at X = 0% revealed a broad Lorentzian signal. This suggested the presence of aggregated Mn2+ and was confirmation of cluster formation found in XRD studies. On the other hand, ESR spectra at higher values of X depicted hyperfine structures characterized by the six unresolved lines of the manganese nucleus, indicating the existence of isolated Mn2+. (C) 2005 Wiley Periodicals, Inc.

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Author(s): Tawansi, A; El-khodary, A; Zidan, HM; et al.
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Author(s): WANG, LH; PORTER, RS
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Author(s): Zhang, KL; Xu, Y; Zheng, CG; et al.
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Author(s): Zhu, LN; Liang, M; Wang, QL; et al.
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Author(s): Zidan, HM
Source: JOURNAL OF APPLIED POLYMER SCIENCE Volume: 88 Issue: 1 Pages: 104-111 DOI: 10.1002/app.11569 Abstract Number: A2003-15-6180B-001 Published: APR 4 2003

Physical properties and beta-phase increment of AgNO3-filled poly(vinylidene fluoride) films

Author(s): Tawansi, A (Tawansi, A); Oraby, AH (Oraby, AH); Badr, SI (Badr, SI); Elashmawi, IS (Elashmawi, IS)

Source: POLYMER INTERNATIONAL Volume: 53 Issue: 4 Pages: 370-377 DOI: 10.1002/pi.1325 Published: APR 2004

Abstract: X-ray diffraction (XRD), infrared (IR) transmition and optical absorption (OA) spectra, differential thermal analysis (DTA), dc electrical resistivity (rho), magnetic susceptibility (chi) and electron spin resonance (ESR) of AgNO3-filled poly(vinylidene fluoride) (PVDF) films, were measured over the filler mass fraction range 0.001 less than or equal to W: less than or equal to 15%. XRD and IR analysis evidenced the increase of alpha- and beta-PVDF crystalline phases due to the AgNO3 filler. The maximum crystallinity increment was found at W = 0.5%. Three endothermic peaks were detected by DTA, and were attributed subsequently to: the first order para-para-electric phase transition, the first-order ferro-para-electric phase transition and the melting. The melting peak was used to calculate the order of reaction and the activation energy of melting. The observed OA peaks and/or plateau were attributed to the charge-transfer complex formed mainly by the AgNO3 filler. This assumption was supported by the diamagnetic susceptibility detected for the present system. The temperature dependence of p was explored according to a previously proposed one-dimensional interpolaron-hopping model. The hopping distance was formulated numerically as a function of temperature and filling level. The ESR findings were attributed to the roles of AgNO3 and dimethylformamide solvent in complex formation. (C) 2004 Society of Chemical Industry.

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Author(s): Bodhane, SP; Shirodkar, VS
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Author(s): Wang, YD; Cakmak, M
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Author(s): YONGLI M
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FeCl3-CoCl2 mixed fillers effects on the structural, electrical and magnetic properties of PVDF films

Author(s): Tawansi, A (Tawansi, A); Oraby, AH (Oraby, AH); Abdelkader, HI (Abdelkader, HI); Abdelaziz, M (Abdelaziz, M)

Source: JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS Volume: 262 Issue: 2 Pages: 203-211 Article Number: PII S0304-8853(02)00590-5 DOI: 10.1016/S0304-8853(02)00590-5 Published: JUN 2003

Abstract:
Films of polyvinylidene fluoride (PVDF) filled with (x)FeCl3(20-x)CoCl2 mixture were prepared by casting method and studied by X-ray diffraction (XRD), differential thermal analysis (DTA), infrared transmission (IR), ultraviolet/ visible optical absorption, DC electrical conduction, DC magnetic susceptibility and electron spin resonance (ESR). XRD implied an amorphous structure for x = 0.0% and 15% and a semicrystalline structure (containing alpha- and beta-PVDF phases at x = 5% and 10% and alpha phase only at x = 20%). Melting and transition temperatures were identified using DTA. Conjugated double bonds and head-to-head defects were detected by IR spectra, which suggested the presence of polarons and/or bipolarons in the polymeric matrix. The DC electrical conduction was discussed using the modified interpolaron hopping model. The optical absorption spectra implied the presence of high spin tetrahedral forms of both Fe3+ and Co2+. The ESR revealed the existence of cluster of both Fe3+ and Co2+ for x greater than or equal to 5% within the PVDF matrix. The temperature dependence of the DC magnetic susceptibility obeyed Curie-Weiss law, indicating the role of the localized energy states. The obtained negative values of the paramagnetic Curie temperature, theta(p), for x < 8.5% indicated an antiferromagnetic interaction, while positive theta(p) obtained for x > 8.5% suggested the ferromagnetic interaction, at lower temperatures. (C) 2002 Elsevier Science B.V.

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