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Effects of natural pigments on the polyvinyl alcohol biopolymer

This research focus on the effects of extracted natural pigments (chlorophyll and anthocyanin) on the secondary (engineering) bonds in the Poly vinyl alcohol (PVA) which play an important role on the physical and chemical properties of polymer. Natural pigments extracted from plants by a simple methods and showed a good agreement with the standard one which characterized by ultraviolet – visible spectroscopy and Fourier Transform Infrared (FTIR). The blend of PVA with pigments where characterized by FTIR, Differential Scanning Calorimeter (DSC), hardness and density. Hardness of the PVA decreases with the concentration of chlorophyll which indicates it is a perfect plasticizer while anthocyanin showed weak effect, while density of blend showed decreasing by chlorophyll more than that with anthocyanin. This is due to the many hydroxyl groups in both polymer and anthocyanin result in strong hydrogen bonding interactions. Results showed that anthocyanin showed higher depression in glass transition temperature (T_g) of PVA than do chlorophyll due to many hydroxyl groups in anthocyanin which rupture the secondary bonds of PVA as well as anthocyanin more polar and has exchangeable proton comparing with chlorophyll. The energies provided by the pigments to destroy the second bonds as a function of pigments concentration (depressed in T_g values).

Biography

Jaleel Kareem Ahmed has completed his PhD from Baghdad University. He is the Dean of the Institute of Foundry and Hammering. He has registered 8 patents with 40 published papers and 3 books. He is a member in Who is Who network. He is a reviewer in Jon Wiley and Sons and Editorial Board Member of Science Publishing Group and a member in Encyclopedia of Chemistry Scientists. He has got the Iraqi Scientist Medal. Currently, he is a Professor of physical chemistry in the College of Materials Engineering , Babylon University, Iraq.

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