NPR ARTS & SCIENCE COLLEGE

(Affiliated to Madurai Kamaraj University)

Natham, Dindigul.

International Conference on Emerging Trends and Challenges - 2018

ICETC '18

Physics

28th December 2018

ICETC 2018

International Conference

On

Emerging Trends and Challenges

in Physics

28th December 2018

ISBN No.:978-81-909344-6-6

Structural and morphological study on Gamma irradiated Polyaniline Nickel oxide composites

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Abstract

Nanostructures Polyaniline (PANI) Nickeloxide (NiO) was synthesized by chemical polymerization method, and radiated using energetic gamma radiation. Structural, optical and morphological properties of nanostructures were characterized by X-ray diffraction (XRD), UV–Vis absorption,Fourier transform infrared spectroscopy (FTIR),Photo luminescence (PL) technique. Scanning electron microscopy (SEM), and Energy dispersive analysis (EDAX). The X-ray diffraction patterns revealed the NiO have a face-centered cubic (FCC) structure and confirmed the presence of high degree of crystalinity nature nano particles in the composites. Study of the optical absorption property using UV-visible spectrometer indicates that the absorption wave length increases with increase in γ- radiation. Fourier transform spectroscopy reveals the presence of vibrational components of PANI slightly varies due to the presence of NiO and increasing radiation. The PL measurement indicates a change in intensity of the emission peaks with radiation as well as a shift towards higher wavelength side. Scanning electron micrographs shows the rod structure of NiO and porous nature of PANI for the composites and EDAX analysis shows that the elements are presented in the composites.

1. Introduction

An organic compound like polymers is a good conducting material. It has a high electrical conductivity similar to metals. The charge named as polarons (replace of electron) is present in the polymer chain which allows the charge mobility throughout the surface. Due to high conductivity of polymers have a variety of advantages over a metal, such as aversion to corrosion, being light-weight, pliability, and low cost. They are finding enormous