

Sintesis, Karakterisasi, dan Uji Serap Radiasi Sinar-X Pada Material Komposit Resin Timbal Asetat

Alvin Fachrully Septiano (24040116420021)

Abstrak

Radiasi yang mengenai tubuh manusia dapat menimbulkan kerugian bagi pekerja dari paling ringan hingga fatal. Akibat interaksi tersebut maka sel-sel dapat mengalami perubahan struktur. Oleh karena itu diperlukan perisai radiasi untuk tujuan proteksi radiasi. Dalam penelitian ini dilakukan pembuatan sample komposit resin yang dengan optimasi komposisi campuran antara resin dan timbal asetat. Dilakukan beberapa pengujian diantaranya bentuk morfologi permukaan sampel dan kandungan senyawa hasil pencampuran sampel menggunakan *Scanning Electron Microscopy and Energi Dispersive X-ray Spectroscopy* (SEM EDX), uji serap paparan radiasi sinar X menggunakan surveymeter radiasi, uji serap panjang gelombang cahaya dengan *Ultraviolet-visible Spectrophotometry* (UV-Vis) dan uji *Fourier-Transform Infrared Spectroscopy* (FTIR) guna menganalisis gugus fungsi yang dihasilkan dari pembuatan sampel. Didapatkan komposisi campuran terbaik sebanyak 50% Timbal Asetat dan 50% Poliester, dengan hasil uji serap paparan radiasi sebesar 750 μSv pada ketebalan lapisan resin timbal 13 mm, hasil uji SEM EDX dengan kandungan yang seimbang antara senyawa Karbon (C), Oksigen (O) dan Timbal (Pb) serta kerapatan antar partikel yang sangat baik. Meskipun demikian komposisi ini memiliki kekurangan seperti yang di dapatkan dari hasil pengujian uji UV-Vis komposisi ini memiliki kemampuan transparansi yang buruk.

Kata kunci : Komposit, Radiasi, Dosis Serap, Proteksi Radiasi, Surveymeter, SEM EDX, UV-Vis, FTIR

Synthesis, Characterization and Absorption Test of X-Ray Radiation on Lead Acetate Resin Composite Materials

Alvin Fachrully Septiano (24040116420021)

Abstract

Radiation hitting the human body can cause harm to workers from the slightest to fatal. As a result of this interaction, cells can undergo structural changes. Therefore radiation shielding is needed for radiation protection purposes. In this research, a composite resin sample was prepared by optimizing the composition of the mixture between resin and lead acetate. Several tests were carried out including the shape of the surface morphology of the sample and the content of the compound from mixing the sample using Scanning Electron Microscopy and Energy Dispersive X-ray Spectroscopy (SEM EDX), absorption test for X-ray radiation exposure using a radiation survey, a wavelength absorption test with Ultraviolet-visible Spectrophotometry. (UV-Vis) and Fourier-Transform Infrared Spectroscopy (FTIR) tests to analyze functional groups resulting from sample preparation. The best mixture composition was 50% Lead Acetate and 50% Polyester, with radiation exposure absorption test results of 750 μSv at a thickness of 13 mm lead resin layer, SEM EDX test results with a balanced content of carbon (C), oxygen (O) and Lead (Pb) compounds. also excellent particle density. Even so, this composition has drawbacks such as that obtained from the UV-Vis test results, this composition has poor transparency capability.

Keywords: Composite, Radiation, Absorbed Dose, Radiation Protection, Surveymeter, SEM EDX, UV-Vis, FTIR

Pembimbing Akademik

1. Heri Sutanto
2. Susilo