

**CHARACTERIZATION OF WOOD BASED ON MASS-ABSORPTION
COEFFICIENT OF GAMMA RADIATION**

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ABSTRACT

Malaysia has many types of commercial value wood. However, the types of woods cannot be known specifically after the woods have been cut and sewn into pieces or sewn timber. Since woods have special absorption properties of gamma ray, this study was designed to determine the coefficient of absorption such that the types of wood could be identified easily. This is due to the fact that the different kind of wood has different absorption coefficient for gamma rays. The gamma ray can be measured by using GM Tube and digital counter. In this experiment direct radiation and the residue radiation after absorbed by wood was measured. The experimental setup were verified by using polyethylene and lead to determine their respective absorption coefficient. Result showed that the experimental value is in good agreement with standard values. For the absorption study on various types of woods, it was found that there is a simple linear correlation between the absorption coefficient and density of the wood sample.

CHAPTER 1

INTRODUCTION

Gamma radiation

Gamma rays (often denoted by the Greek letter gamma, γ) are energetic form of electromagnetic radiation produced by radioactive decay or other nuclear or subatomic processes such as electron-positron annihilation. Gamma rays form the highest-energy end of the electromagnetic spectrum. They are often defined to begin at an energy of 10 keV, corresponding to a minimum frequency of 2.42 Exahertz , or a maximum wavelength of 124 picometers, although electromagnetic radiation from around 10 keV to several hundred keV is also referred to as hard X-rays. It is important to note that there is no physical difference between gamma rays and X-rays of the same energy — they are two names for the same electromagnetic radiation, just as sunlight and moonlight are two names for visible light. Rather, gamma rays are distinguished from X-rays by their origin. *Gamma ray* is a term for high-energy electromagnetic radiation produced by nuclear transitions, while *X-ray* is a term for high-energy electromagnetic radiation produced by energy transitions due to accelerating electrons. Because it is possible for some electron transitions to be of higher energy than some nuclear transitions, there is an overlap between what we call low energy gamma rays and high energy X-rays. Gamma rays are a form of ionizing radiation; they are more penetrating