

Abstract

Indonesia is one of the largest pineapple producers in the world, but the unutilised pineapple peel waste reaches 500 thousand tonnes per year. This research aims to develop pineapple peel-based material as an anti-heat and anti-radiation material, given the content of lignin, polyphenols, and flavonoids in it that increase resistance to heat and radiation. The research was conducted in the laboratories of FMIPA UNY and BRIN using a hot plate, furnace, and Geiger-Müller Counter to measure heat and radiation resistance. Pineapple peel samples were dried at 100°C for 12 hours, blended into fibres, then mixed with epoxy resin in a 2:1 ratio. Test results showed that samples with a thickness of 1.5 cm were able to withstand 30%-50% heat in the hot plate test and 40%-50% in the furnace test, with an optimum temperature of 185-300°C. Radiation testing using Cs-137 source showed that the sample can withstand 35%-40% of radiation, with higher effectiveness at 1.5 cm thickness. The results of this study prove that pineapple peel can be an environmentally friendly alternative material for heat and radiation protection, potentially applied in the laboratory protective clothing industry and other sectors.