

Palm kernel based wood adhesive

Abstract

Palm kernel cake is a by-product of palm kernel oil industry. The production of palm kernel cake is more than 5000 million tons annually in the past few years. This quantity is expected to rise further in the future due to production of bio-diesel. Currently palm kernel cake is used for animal feed supplement such as cattle and goat. Due to indigestible compounds in palm kernel cake, it is less suitable for animals such as poultry, fish and swine. However palm kernel cake contains about 20% protein, with this protein composition palm kernel cake can be used as ingredient of protein based resin. Unlike soya bean which contain higher protein composition and can be used directly as ingredient of protein based resin, palm kernel cake require protein enhancement before it can be used for this purposes. In this study, wood adhesive was produced using palm kernel cake with protein content enhancement as a base ingredient. Soya protein extract was selected as a protein enhancement of palm kernel cake. Here the enhanced protein content palm kernel cake was reacted with polyetheleneimine and maleic anhydride at alkali environment. The experimental study was conducted at various compositions and various strength of alkali. The wood adhesive produced was tested on type II plywood. Japanese Agriculture Standard of strength and durability test was employed for the characterization of the adhesive produced. Results show that, palm kernel cake can be used as ingredient of protein based wood adhesive. In certain condition the mixture of palm kernel and soya protein show that the wood adhesive produced better strength and reliability compared to unmixed soya protein extract.