The surface hardness of mild steel and plywood coated with different blending ratio of rice husk ash-based geopolymer

ABSTRACT

Malaysia has a great potential to reuse the agro-waste and reduce the environmental issues generated from the painting industry and agro-waste and achieve the objective of sustainable development. The objective of this work is to analyse physical effects of different blending ratio of rice husk ash based geopolymer binder (GB) surface coating on the hardness of mild steel and plywood. Geopolymer is an inorganic material produced by activated alkaline solution and aluminosilicate sources. Since Malaysia has been producing abundant of rice husk, this rice husk as the aluminosilicate source is used to form geopolymer. As it is known that filler is one of the combinations in paint including epoxy paint, the rice husk ash which has an abundant of silica content can be a ground-breaking source. Thus, an efficient eco-friendly coating that have a good fire resistance properties are very demanding. An optimum coating was formed by optimizing different ratio of GB with water-based or oil-based paint in term of hardness of surface coated. Based on the Rockwell hardness test, the result showed that 2:1 ratio of water-based coated mild steel plate has the highest Rockwell hardness number of 53.08, which meant the lowest depth of impression of 0.1538mm due to 150kgf major and minor load. This implies that different blending ratios addition of GB on plate surface have an effect on the hardness of mild steel and plywood.

Keyword : Aluminosilicate; Geopolymer; Hardness; Rice husk