

B-1-5 Preparation and properties of coatings with oleic acid (OA) modified shell powder as filler for thermal insulation

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ABSTRACT

Waste shell stacking with a significant odor and toxicity is a serious hazard to our living environment. For reducing the environmental pollution and making good use of natural resources, shell powder was applied as filler in coatings for outdoor thermal insulation. For reducing the agglomeration of shell powder and increasing the compatibility between the emulsion and shell powder, oleic acid (OA) was used to modify the properties of shell powder. To make the coatings possess hydrophobic nature and better resistibility to severe environment, nano-silica was used in this coating, which can produce micro-nano surface. The settlement volume in paraffin and the oil absorption rate of shell powder were used to characterize the compatibility between the shell powder and emulsion of coating. The spectrum reflectance of shell powder modified and unmodified was measured by Lavy500 UV / Visible Spectrophotometer. The basic formula and preparation process of coatings were decided by experiments. The spectrum reflectance, heat insulating properties on cement board and steel plate, contact angle and scrub resistance of the thermal insulation coatings were experimentally examined. It was found that modified shell powder as filler for thermal insulation coating was promising.

KEY-WORDS: Shell powder, coating, heat insulation; scrub resistance, hydrophobicity