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Modification of PVC-compositions for Linoleum

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Abstract

© Published under licence by IOP Publishing Ltd. Nowadays, modification is one of the most effective methods of enhancing quality of building compound materials and broadening the scope of their application. Polyvinylchloride (PVC) linoleum is manufactured and used massively in construction industry. The plasticizer EDOS is applied as one of the components of this composite material, it represents the mixture of derivatives of 1,3-dioxane distinguished from other traditional plasticizing agents by its lower cost and toxicity. At the same time, this plasticizer, due to its lower heat stability and higher fugitiveness, requires incorporation of special types of modifying additives into the linoleum composition. Those additives reduce its migration from flooring material during its production and maintenance. In this view, reactive compounds with epoxy and cyclocarbonate groups able to form hydrogen and chemical bonds with the EDOS plasticizer are of certain interest. The authors proposed the method of modification of PVC-compound materials by application of epoxidized soybean oil with conversion of epoxy groups in a modifier (%) 53, 75 and 90. For analysis the authors have chosen cyclocarbonate Laprolat-83 of domestic industrial manufacturing. Using the standard and advanced high-information physical and chemical methods, the authors have researched the properties of epoxidized soybean oil, the processes of migration of the plasticizer EDOS from PVC-paste and PVC-linoleum, miscibility of plasticizer with modifying agent. The composition formulation has been optimized. The implemented research has resulted in reducing migration of volatile substances from PVC-paste and linoleum, achievement of additional flexibilizing effect, enhancing modulus of elasticity and wearing property, shrinkage reduction and improvement of sanitary and hygienic properties of linoleum.

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