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Flexible polyurethane blown with nanoclay as footwear component

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Recently, PU foams composite of solid-gas material intrigued significant interest due to its wide applications. Conventionally polyurethane foam is prepared by adding two types of blowing agent, physical blowing agent (low boiling point solvent) and chemical blowing agent (water). In the present work, for the first time a series of flexible polyurethanes are developed by addition increasing amount of nanoclay (have been developed in our lab) 0.5-3% as a chemical blowing agent. The inter layer -OH group of the developed filler react with the -NCO terminated pre-polymer of PU to generate flexible polyurethane foam. The developed polyurethane contained exfoliated nanoclay structure cross linked with the native PU which is further confirmed by FESEM analysis. As a result it shows that the addition of nanoclay has been increased the flexibility. The physical, morphological and thermal properties of the developed PU foams have been studied to find suitability in shoe sole. The polyurethane foam prepared using the developed compositions are flexible and light-weight while maintaining other physical properties like hardness, density, abrasion resistance and tensile strength in advisable range for shoe sole application.

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