Influence of inorganic filler surface characteristics on the compatibility with polyurethane foam matrix

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In polyurethane industries, various kinds of fillers (talc, silica, wood fiber) are added to the polyurethane foams in order to improve their physical properties. Depending on the filler surface characteristics, the polyurethane composite foams can possess wide ranges of physical properties. In this study, polyurethane foams were fabricated using surface modified fillers (eg, talc treated with zinc stearate, silane coupling agent). The original talc is relatively hydrophobic with zinc stearate treatments, but it can be hydrophilic with silane treatments. Scanning electron microscope was used to analyze the morphology of polyurethane composite foams, and phase separated matrix images were additionally examined with atomic force microscopy.