Supplementary Material

Experimental details

Materials

The polyol component selected in this study had an aliphatic polyether backbone (a blend of R180 and R105, Huntsman Polyurethanes), having a hydroxyl value of 400 mg KOH/g of polyol and an approximate molecular weight of 800. The isocyanate was a polymeric MDI (Suprasec 5005, Huntsman Polyurethanes). A catalyst blend containing pentamethyldiethylenetriamine and dimethylcyclohexylamine was used. The surfactant used was Tegostab 8404 (Goldschmidt AG). Distilled water was used as chemical blowing agent. Montmorillonite nanoclay (Cloisite 25A) was purchased from Southern Clay Products, USA. The composition of foaming agents in polyol blend is given in Table S1.

Table S1. Formulation of polyol blend

Component	Ratio (*pphp)
Surfactant	1.2
Catalyst blend	1.2
Distilled water	1.0

*pphp = parts per hundred parts of polyol

Making dispersions and foaming

Clays were dried in a vacuum oven at a temperature of 100° C. The dried clay was first dispersed in polyol by high intensity ultrasonication for 10 min. The clay suspension was then slowly mixed with polyol by gentle stirring by heating at 60° C. A final dispersion of clay-polyol blend is conducted by further ultrasonication for 30 min. A high intensity probe sonicator (frequency = 20 kHz, probe diameter = 0.25 inch, Branson Ultrasonic) was used. The clay suspension in polyol is then mixed with foaming agents and water and stirred at a speed of 2000 rpm for 15 s. Isocyanate was then added to polyol blend at a weight ratio of 1.3:1 with respect to polyol blend (isocyanate index = 105). The mixture was stirred for 12 s at a speed of 2500 rpm and the reacting liquid poured immediately into a small mold of size 10×10×15 cm^3. The mold was quickly and tightly closed. The foam was de-molded after 10 minutes and allowed to cure for 2 days.

Foams without clay were also made by the same procedure. All the foams were molded to an approximate density of 120 kg m^{-3}.

Characterizations

The rheology of suspensions was studied using a Rheometer under couette flow, using a co-axial cylindrical geometry (Haake, Rotovisco RT20). Diffraction studies on foam were carried out by an x-ray diffractometer (X'Pert Pro, PANalytical). Transmission electron microscope (JEOL 1210) was used for a visual account of clay platelets in foam. Foam samples for TEM were prepared by an ultramicrotome (Reichert Ultracut S) after embedding in an epoxy resin. The cell morphology of the foam samples were probed by Environmental scanning electron microscope (FEI Quanta). The rectangular shaped foam samples for ESEM were cut by using a sharp razor blade. The distance at which the samples were cut was kept constant from the bottom surface of foam. ESEM images were analyzed by an image analysis software (ImageJ).