

There is now provided a closed cell rigid polyisocyanate based foam blowing with a C1-C4 hydrofluorocarbon and water as blowing agents, which possesses a uniform density gradient varying by not more than 10 percent. There is also now provided a froth foaming mixture having good flow by employing a hydroxy terminated polyol which is pH neutral and a tertiary amine ether blow catalyst in an amount of 0.5 weight percent or more, using water and a C1-C4 hydrofluorocarbon having a boiling point of 300 K. or less as co-blowing agents. There is also provided a polyol composition having an average OH number of less than 400 and an average functionality of greater than 4, which when reacted with the isocyanate in the presence of a C1-C4 hydrofluorocarbon, yields a rigid closed cell polyisocyanate based dimensionally stable foam. The formulation according to an especially preferred embodiment of the invention simultaneously satisfies the following requirements: 1) a formulated polyol composition having a viscosity of 550 cP or less; 2) the isocyanate stream and the formulated polyol stream dispensable at a 0.9:1 to 1.3:1 weight ratio, respectively; 3) frothing when dispensed from a static mixer; 4) produces a frothing foaming mixture having excellent flow characteristics as demonstrated by a substantially uniform density gradient; 5) and produces a dimensionally stable closed cell foam having a low overall density of 2.5 pcf or less.

5514726**POLYMER FOAMS WITH INHERENT
NONFLAMMABILITY AND THERMAL
STABILITY AND METHODS OF
PREPARATION THEREOF**

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Polymeric foams with novel chemical compositions are prepared by the condensation of specially-synthesized precursors, which contain (in addition to carbon and hydrogen) one or more of the following elements: oxygen, fluorine, nitrogen (in structures with stable chemical bonds), silicon, boron, phosphorus (in high oxidation states), and certain metals (and/or their oxides and hydroxides). Upon mixing in the proper proportions and/or heating these precursors react rapidly to generate polymeric networks, consisting of heterocyclic crosslink centers, connected with heterochain segments; hydrogen is largely eliminated or replaced by fluorine. These structures possess inherent nonflammability and high thermoxidative stability. Foaming is effected by the gaseous by-products of the condensation reactions, as well as by the addition of foaming agents. The resulting foam products can be formulated to have a wide range of densities and flexibilities.