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Morphological composite materials formed from different precursors

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Feger et al.

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[54] **MORPHOLOGICAL COMPOSITE MATERIALS FORMED FROM DIFFERENT PRECURSORS**

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[51] Int. Cl.⁵ **C08G 69/26; B32B 27/00**

[52] U.S. Cl. **528/335; 528/59; 528/67; 528/129; 528/152; 528/159; 528/350; 528/351; 528/353; 526/346; 526/347; 526/347.2; 525/432; 525/481; 525/524; 525/526; 428/413; 428/423.1; 428/429; 428/473.5; 428/500; 264/231; 264/236; 264/331.11**

[58] Field of Search **264/231, 236, 331.11; 528/152, 159, 59, 67, 129, 350, 170, 176, 220, 229, 351, 353, 335; 525/432, 481, 524, 526; 526/346, 347, 347.2; 428/413, 423.1, 429, 500, 473.5**

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ABSTRACT

[57] A method of producing a multiphase polymer is disclosed whereby the phases have the same chemical structure but have different morphological states and thus different properties. This is achieved by forming a mixture of precursors of the polymer, at least one of the precursors having a reaction rate higher than the other precursor or precursors in the mixture. The precursor having the highest reaction rate is then converted to obtain a composite of a polymer and the precursors that are not polymerized. This mixture might also be formed by mixing a soluble polymer with its precursor. The polymer/precursor composite is processed to obtain the structure having different morphological states by either choosing the reaction conditions to convert the unconverted different morphological states by either choosing the reaction conditions to convert the unconverted precursors such that the obtained polymer differs in its morphology/ properties from the first obtained polymer or by applying stress to the composite and then converting the still unreacted precursor or precursors in the composite such that different morphological states are obtained.

33 Claims, No Drawings