Production of nanocomposite with tailored properties (*New - Winter 2019*)
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The advanced composite market is predicted to reach $23.52 billion by 2020, while it was valued at $16.67 billion in 2015. The growing global interest in advanced composites signifies a high demand for these materials which can be used in various applications from packaging to aerospace. Among all materials for production of advanced polymeric composites, boron nitride nanotube (BNNT) has attracted great attentions due to its special characteristics, such as mechanical strength, thermal conductivity, electrical resistivity, thermal stability, optical clarity, piezoelectric characteristics and radiation shielding. To take advantage of these properties of BNNTs as fillers in polymeric matrices, it is essential to achieve homogenous distribution and dispersion of BNNT. Well dispersion and distribution of BNNTs into polymeric matrices remain very challenging due to their low dispersibility in polymer matrices as well as lack of experimental studies due to difficulty in mass production of good quality BNNTs. In this project, dispersion and distribution of BNNTs throughout polycarbonate (PC) matrix, using different mixing conditions have been studied, characterized, and analyzed. The ultimate goal of this project is to develop thermally conductive yet electrically insulating polymeric nanocomposites suitable for applications such as microelectronic packaging, thermal management, and power generation.

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