Synthesis and characterization of functionalized-hyperbranched polymer (HBP) for calcium carbonate ($CaCO_3$) mineralization

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Calcium carbonate ($CaCO_3$) is one of the most plenty and important biominerals presenting in natural environment. Under natural condition, however, formation of $CaCO_3$ occurs slowly. Many additives including polymer and protein, are studied for self-assembly of $CaCO_3$ for various morphologies and applications such as hybrid materials, medicine, catalysis, food processing because of their several advantages.

Herein, We developed a method of acceleration $CaCO_3$ synthesis rate with highly functionalized hyperbranched polymer (HBP). HBP contains multiple glycerol units and hydroxyl (OH) groups. These hydroxyl groups can be modified with various functional group such as amine, carboxylic, etc. Their structures and properties have been fully characterized by means of various instrumental analysis techniques. Furthermore, we have plan to develop mineralization $CaCO_3$ with CO_2, not only does self-assembly synthesized $CaCO_3$ minerals offer several advantages including morphology, physical, chemical and biocompatible properties but also reduce CO_2 by using it as carbonate source.