

## METHOD OF PRODUCING CALCIUM CARBONATE NANO PARTICLES

### TECHNOLOGY DESCRIPTION

A simple, novel and low cost method to synthesis calcium carbonate nanoparticle by using aragonite polymorph from cockle shells.

### TECHNOLOGY FEATURES

The method involves a simple mechanical grinding of the micron-sized cockle shell powder in the presence of non-toxic and non-hazardous biomineralization catalyst, dodecyl dimethyl betaine (BS-12). The calcium carbonate nanoparticle with the aragonite phase is easily replaceable and integral to bone tissue. The method has a great potential in industry for large scale production of calcium carbonate nanoparticle for biomedical applications. Calcium carbonate nanoparticle can be used nanobiocomposite (scaffolds, bone paste) for bone repair, anti carcinogenic drug and non-viral drug carrier. Calcium carbonate nanoparticle also can be produced industrially for manufacturing feed-stuff, paint, ink and rubber.

### ADVANTAGES

- Simple
- Cost-effective
- Can be use for large scale production of calcium carbonate nanoparticle

### INDUSTRY OVERVIEW

#### Prospect: Plastic Manufacturers/Paper Manufacturers

An overall demand for Precipitated Calcium Carbonate (PCC) is forecasted to rise from 7.75Mt in 2004 to 9.7Mt by 2010, an average rise of around 4.4% per year. Growth of around 2% per year is forecasted, with the majority of the increase in Asian countries, especially China and India. World consumption of PCC in plastics is expected to rise from 700,000t in 2004 to around 765,000t to 2010. Similarly, the use of Calcium Carbonate in paper is forecasted to rise by an average of 5% a year and reach 7.2Mt by 2010. Malaysia is one of the largest plastic producers in Asia, with over 1550 manufacturers employing some 99,100 people. The country's plastic products are exported worldwide including EU, China, Hong Kong, Singapore, Japan and Thailand. The global market for Calcium Carbonate is forecasted to reach 113.9 million tonnes by the year 2017. Paper represents the largest end-use market for PCC worldwide, followed by the plastics industry. However, plastics represent the fastest growing end-use market for PCC in future. Potential target markets are plastic manufacturers, paper manufacturers. Potential sales channel is direct sales to the plastic producers, while the potential sales method is likely to be through direct sales force and manufacturer's representative.



**Prof. Dr. Md Zuki Abu Bakar @ Zakaria**  
Faculty of Veterinary Medicine  
zuki@upm.edu.my