Particle size control of synthesized calcium carbonate(CaCO₃) by water -in -oil(W/O) microemulsion method

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Micro and nanosized particles provide improved mechanical and optical properties. Reducing the particle size into submicron regions is necessary for wide industrial applications. Calcium carbonate (CaCO₃) is one of the most widely used inorganic materials. Nanosized CaCO₃ particles have been applied to various fields including biomedical applications (drug delivery and bone regeneration), filler materials and food industries. Various methods have been reported for an effective synthesis of nanosized particles. Among them, water -in -oil (W/O) or reverse microemulsion method has been researched for producing nanoparticles. In this study, we investigated the effects of operating variables in particle size of produced CaCO₃ through W/O microemulsion method. Reaction temperature, amount of surfactants, oil -to -water ratio were selected as major conditions. The particle size and morphology of CaCO₃ were characterized by using field - emission scanning electron microscope(FE -SEM), X-ray diffraction(XRD) and Zetasizer.