



## Polymeric stabilization of a calcium sulfate particle produced by 3D printing for bone regeneration applications.

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### Abstract

This research explored on a new path of preparation the porous material by using combination of water in oil emulsion templating along with the supplementary of low intensity polymerization reaction. Poly(styrene/ethylene glycol dimethylacrylate)HIPEs were prepared by using a domestic microwave for fabricating the multiscale porosity material. The radical polymerization reaction was precursor at the lowest intensity of 10 watt resulted with prognosticated result towards the surface topography of poly(sty/edgma)HIPEs as the monomer and crosslinker respectively. The ratios of water and oil phase were varied with the constant concentration of crosslinker and stabilizer. The different in the oil phase resulting to the gradually increment of the pores size from 60.2  $\mu\text{m}$ , 95.4  $\mu\text{m}$  and 126.3  $\mu\text{m}$ . Varying of the aqueous phase at 80%, 90% 92% and 94% with 2 wt% of surfactant showed n growing level of pore interconnectivity from 60.2  $\mu\text{m}$  to 109.9  $\mu\text{m}$ . Cellular morphologies of poly(sty/edgma)HIPEs were observed by using FE-SEM. In addition, to approbate the crosslinked poly(sty/edgma), ATR-FTIR were employed. It displays a distinct narrow peak around 770  $\text{cm}^{-1}$  which explains the C-H stretching between the aromatic planar of styrene and carboxyl group of edgma. A preliminary result of absorption test was recorded for discovering the potential of poly(sty/edgma)HIPEs towards the dye absorption. Poly(sty/edgma)HIPEs with 90% volume of oil phase ratio were tested with varied concentration ( $\text{g}/\text{cm}^3$ ) of methylene blue and orange. It were appraised a positive results of dyes captivation in between of a week period. Poly(sty/edgma)HIPEs were furthered investigated by TGA/DSC and compression test.

### Biography:

Imran Azman is an assistant professor of Petroleum and Petrochemical College at Chulalongkorn University and he worked in Department of Mechanical Engineering Technology, College of Industrial Technology, King Mongkut's University of Technology North Bangkok, Bangkok 10800, Thailand.

### Speaker Publications:

1. Synthesis and characterization of *Dioscorea hispida* sp. tuber starch-polyacrylamide wood coating and its facile inhibitory towards *Pycnoporus sanguineus* and *Coptotermes curvignathus* October 2016Progress in Organic Coatings 99:182-190
2. Novel *Dioscorea hispida* starch-based hydrogels and their beneficial use as disinfectants. August 2015Journal of Bioactive and Compatible Polymers 31(1)

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