CHAPTER V

CONCLUSION

1. Mechanical properties, especially the Young's modulus, of conventional acrylic bone cement can be slightly improved by replacement of PMMA with 80/20 PMMA-Co-PEMA.

2. Mechanical properties of the copolymer bone cement can be significantly improved by reinforced with particulate reinforcement such as barium sulphate ($BaSO_4$) and hydroxyapatite (HAP). The Young's modulus was found to increase by 38.82 % and 39.09 % for 0-40 weight percent ranges of $BaSO_4$ and HAP, respectively.

3. Introduction of a silane coupling agent (3-trimethoxysilyl propylmethacrylate) to the surface of hydroxyapatite was observed to further enhance the mechanical properties of the bone cement. The Young's modulus increased up to 60.30 % when the copolymer bone cement was reinforced with 40 % by weight of HAP having 5.21 % silane content.

SUGGESTIONS

1. Replacement MMA monomer with n-BMA monomer should improve not only mechanical, physicochemical, and biological properties but also exhibit lower exotherm than PMMA bone cement.

2. PMMA-Co-PEMA bone cement having higher PEMA moiety than 20 % should be studied in order to improved toughness of the bone cement.

3. The survey of the setting properties found that exotherm of the PMMA-Co-PEMA bone cement decreased with increasing volume fraction of $BaSO_4$ upto 10 % by weight of the copolymer but increased again when the amount of $BaSO_4$ was more than 10 %. Thus, dependence of exotherm on amount of reinforcement should be further studied.