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Aging Time Effect of 58s Microstructure

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Abstract : 58S (60SiO2-36CaO-4P2O5), three-dimensionally ordered macroporous bioactive glasses (3DOM-BGs) were synthesized by the sol-gel method using dual templating methods. non-ionic surfactant Brij□56 used as templates component produced mesoporous and the spherical PMMA colloidal crystals as one template component yielded either three-dimensionally ordered microporous products or shaped bioactive glass nanoparticles. The bioactive glass with aging step for 12 h at room temperature, no structure transformation occurred and the 3DOM structure was produced (Figure a) due to no shrinkage process between the aging step. After 48 h time of o 3DOM structure remained and, nanocube with ~120 nm edge lengths and nanosphere particle with ~50 nm was obtained (Figure c, d). PMMA packing templates have octahedral and tetrahedral holes to make 2 final shapes of 3DOM-BGs which is rounded and cubic, respectively. The ageing time change from 12h, 24h and 48h affected to the thickness of interconnecting macropores network. The wall thickness was gradually decrease after increase aging time.

Keywords : three-dimensionally ordered macroporous bioactive glasses, sol-gel method, PMMA, bioactive glass
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