

Mayasari Hariyanto, 2018 Optimalisasi Fase Amorf *Glass Ionomer Cement* (GIC) Melalui Variasi Media *Quenching*. Skripsi ini dibawah bimbingan Drs. Siswanto, M.Si. dan Jan Ady, S.Si., M.Si. Departemen Fisika Fakultas Sains dan Teknologi Universitas Airlangga.

ABSTRAK

Fase amorf merupakan tahapan penting dalam pembuatan *Glass Ionomer Cement* (GIC). Pembentukan fase amorf memerlukan proses pendinginan cepat atau *quenching*. Penelitian ini bertujuan untuk mengetahui media *quenching* yang optimum dalam pembentukan fase amorf GIC. Sampel GIC dibuat dengan mencampurkan alumina (Al_2O_3), silika (SiO_2), aluminium fosfat (AlPO_4) dan kalsium florida (CaF_2) menggunakan HEM (*High Energy Milling*). Proses sintering dilakukan menggunakan suhu $1300\text{ }^\circ\text{C}$ selama satu jam. Proses *quenching* dilakukan dengan variasi media secara berturut-turut adalah nitrogen cair, air es, air, *refrigator* dan *freezer*. Kristalinitas dari kelima sampel GIC tersebut secara berturut-turut adalah 3,012 %; 3,094 %; 1,052%; 3,971 % dan 0,756 %. Media *quenching* yang paling optimum dalam pembentukan fase amorf GIC adalah media air dengan laju *quenching* $5,75\text{ }^\circ\text{C}/\text{menit}$ dan kristalinitas sebesar 1,052 %.

Kata kunci: fase amorf, *glass ionomer cement* (GIC), *quenching*.

Mayasari Hariyanto, 2018 Optimalitation Amorphous Phase of Glass Ionomer Cement (GIC) Through Variation of Quenching Media. This thesis under the guidance of Drs. Siswanto, M.Si. and Jan Ady, S.Si., M.Si. Departement of Physiscs Faculty of Science and Technology Airlangga University.

ABSTRACT

The amorphous phase is an important step in formation of Glass Ionomer Cement (GIC). The formation of an amorphous phase requires a rapid cooling process or quenching. This study aims to determine the optimum quenching media in the formation of amorphous phase of GIC. GIC samples were prepared by mixing alumina (Al_2O_3), silica (SiO_2), aluminum phosphate ($AlPO_4$) and calcium fluoride (CaF_2) using HEM (High Energy Milling). The sintering process is carried out using a temperature of 1300 °C for one hour. The quenching process is carried out with variations of media in a row are liquid nitrogen, ice water, water, refrigerators and freezers. The crystallinity of the five GIC samples respectively was 3,012%; 3,094%; 1,052%; 3,971% and 0,756%. The most optimum quenching media in the amorphous phase formation of GIC is a water with a quenching rate of 5,75 °C/min and crystallinity of 1,052%.

Keyword: *amorphous phase, glass ionomer cement (GIC), quenching.*