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# Abstracts by alphabetical order

## Polymerization kinetics of acrylic bone cement: effect of two different antibiotics.

J. Abenojar<sup>1</sup>, E. Paz<sup>2</sup>, Y. Ballesteros<sup>2</sup>, J.C. del Real<sup>2</sup>, M.A. Martinez<sup>1</sup>

<sup>1</sup> *Materials Science and Engineering Department, Universidad Carlos III de Madrid, Av. Universidad, 30, 28911 Leganes, Spain*

<sup>2</sup> *Mechanical Engineering Department, Universidad Pontificia Comillas, Alberto Aguilera, 35, 28015 Madrid, Spain*

In this work the influence of addition of vancomycin and cefazolin antibiotics is evaluating in relation with the polymerization kinetic. Antibiotic-loaded bone cements are widely used for primary hip arthroplasties due to the intractability and high cost of infections. Cement with antibiotic has been shown as one of the most effective composite for therapeutic arms in both the prophylaxis [1] as in the treatment of periprosthetic infection [2,3]. Before new cements are clinically implemented, it is essential to investigate their thermal properties.

Thermal and chemical necrosis are the two major problems associated with the usage of bone cements. In this study, PALACOS®R+G, commercial bone cement, was evaluated using differential scanning calorimetry (DSC), dynamic methods from 0 to 200 °C at 5 °C/min for determining glass transition temperature. The second test was an isothermal one; a temperature range of 10, 20 and 30 °C and duration of 30 min were chosen; a second segment of dynamic scanning from the isothermal temperature to 180°C at a scan rate of 10°C/min was added, this assay was performed to calculate the free residual monomer percent and kinetic parameters. The influence of the addition of two antibiotics, Vancomycin and Cefazolin in various quantities, on the rate and heat of polymerization and glass transition temperature of resulting polymer was investigated, and the kinetic parameters were calculated by Kamal equation.

The glass transition temperatures, for the antibiotic-loaded bone cements and of the basic bone cement, were similar. Besides, under isothermal method, the addition of the two antibiotics had no discernable adverse effects on the polymerization kinetics. These conclusions imply the thermal safety of the new antibiotic-loaded bone cements, in terms of the bone cement polymerization.

**Keywords:** Bone cements; antibiotics; polymerization kinetic; thermal properties

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