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FACULDADE DE CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA

Department of Materials Science – CENIMAT/I3N

Glass-ceramics for dental restoration

DCM-FCT/UNL and **CENIMAT/I3N:**

-Sctructural Materials Group

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i3N
INSTITUTE FOR NANOSTRUCTURES, NANOMODELLING AND NANOFABRICATION
RESEARCH, INNOVATION AND ENGINEERING APPLICATIONS

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Research area: Glass-ceramics

Objectives

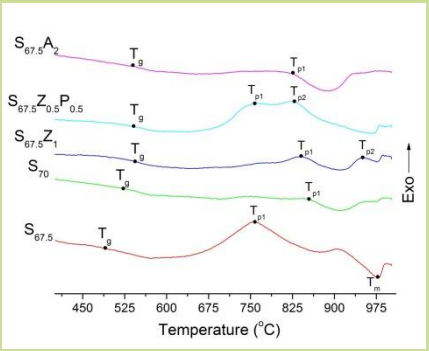
- To develop glass-ceramics with satisfatory mechanical, chemical and aestethical properties to be used as dental restoration all-ceramic materials.
- To prepare homogeneous and defect-free glass compostions and to obtain glass-ceramics by controlled nucleation and crystallization of the glasses
- To develop adequate microstructure and crystalline phases in the glass-ceramics to achieve the required properties for the envisaged application.

Methodology

1. Preparation of the parent glasses
2. Synthesis of the glass-ceramics
3. Structural (DTA, XRD) and microstructural characterization (SEM)
4. Mechanical characterization (flexural strength, Vickers microharness and fracture toughness)
5. Chemical durabilitiy and optical tests.

Expected Results

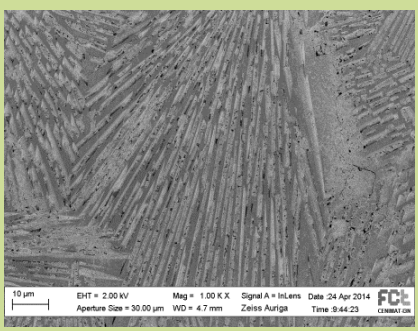
- Homogeneous and defect-free parent glasses
- Adequate heat-treatment schedules for glass-ceramic synthesis
- Microstructure-tailored glass-ceramics
- High mechanical strength and high chemichal resistance glass-ceramics
- White-translucid glass-ceramics



DTA curves for different glass compositions.

Parent glass samples

Glass-ceramic samples



Microstructure of glass-ceramics acicular crystals.

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