

### Supplementary materials

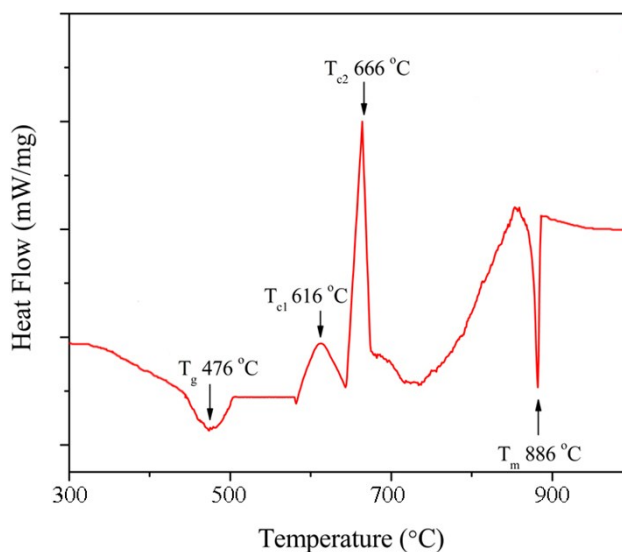


Fig.1 DSC profile of the precursor oxyfluoride glass

Fig. 1 shows the DSC profile of the precursor oxyfluoride glass, in which two exothermic peaks can be observed. The first peak at 616 °C is the crystallization peak of CaF<sub>2</sub>, while the peak at 666 °C is attributed to aluminum silicate. From this thermogram, we deduced the glass transition temperature (T<sub>g</sub>), the crystallization onset temperature (T<sub>c1</sub>) and the crystallization peak temperature (T<sub>c2</sub>) of oxyfluoride glass. According to this result, controllable crystallization can be acquired by adjusting the thermal treatment temperature. In our report, the thermal treatment temperatures were 580 °C, 590 °C, and 600 °C for obtaining proper micro-structured transparent glass ceramics (GCs). Finally, 580 °C is regarded as the optimal devitrification temperature to obtain GCs containing CaF<sub>2</sub> nanocrystals sized at ~10 nm.