Supporting Information

3D printing of high performance cyanate ester thermoset polymers.

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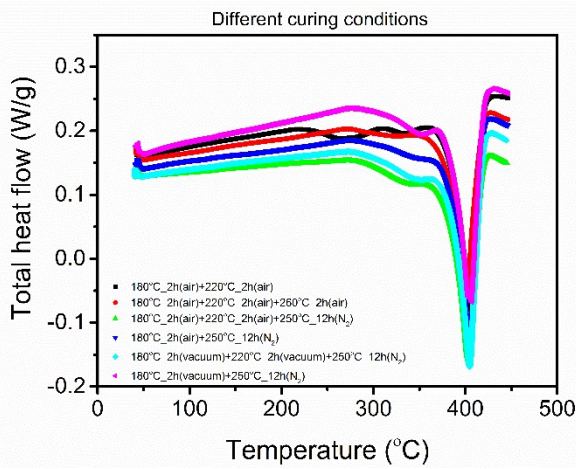
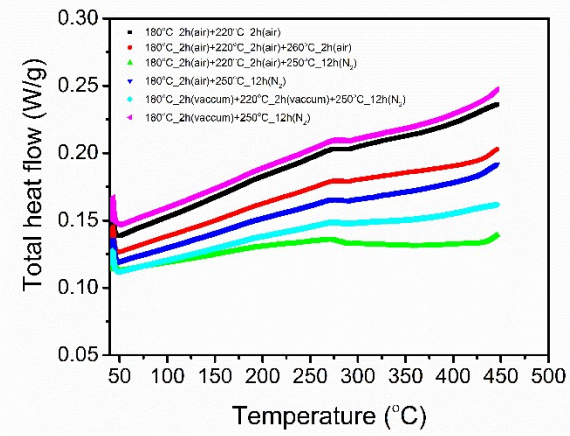
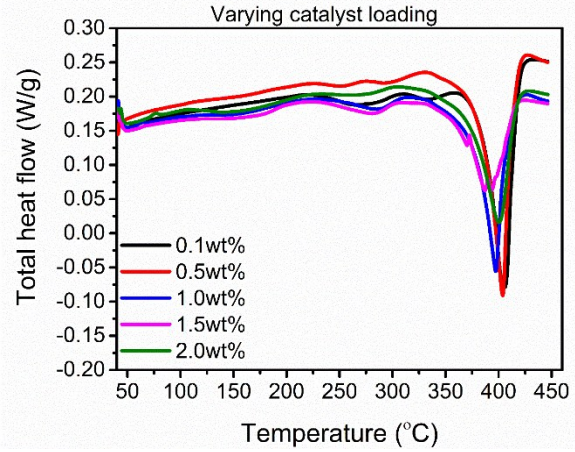
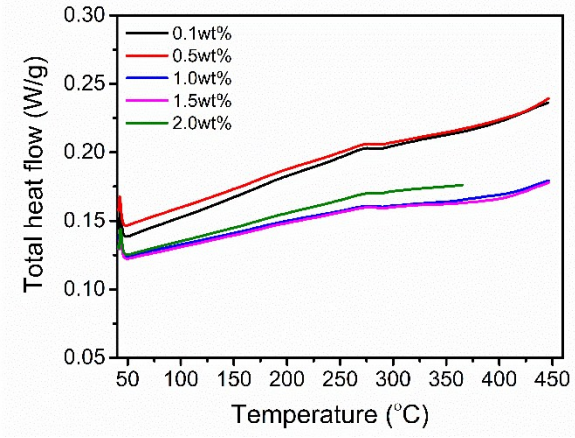
Differential Scanning calorimetry curves

The curing conditions of cyanate ester resins was done at three different atmospheres viz., air, nitrogen and vacuum. Both first and second heating cycles are presented and we see that there is no drastic change in the Tg with different curing conditions. Note, that for optimizing the cure conditions, a catalyst loading of 0.1wt% was chosen. Upon increasing the catalyst loading, the curing conditions become more exothermic which leads to charring of the resin.



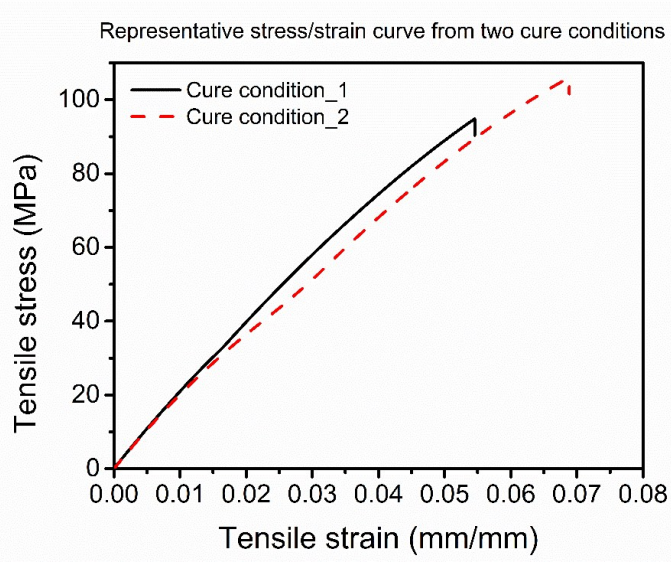






Tensile tests

Tensile tests were done on 7 test coupons and a representative stress-strain curve is shown below. Cure condition_1 corresponds to samples cured under 180 °C for 2h followed by a post-cure at 220 °C for 2h both under air atmosphere. Whereas, cure condition_2 has the same cure profile as the previous with an additional post cure for 250 °C for 12h under nitrogen atmosphere.



Nano-indentation

Loading curves from nano-indentation tests are shown for the printed CE part and printed-carbonized (at 1050°C) CE part.