

## Supplementary Information

### **Study on the definition, mechanism and controllability of secondary bubbles based on the bubble nucleation model in injection foaming polypropylene**

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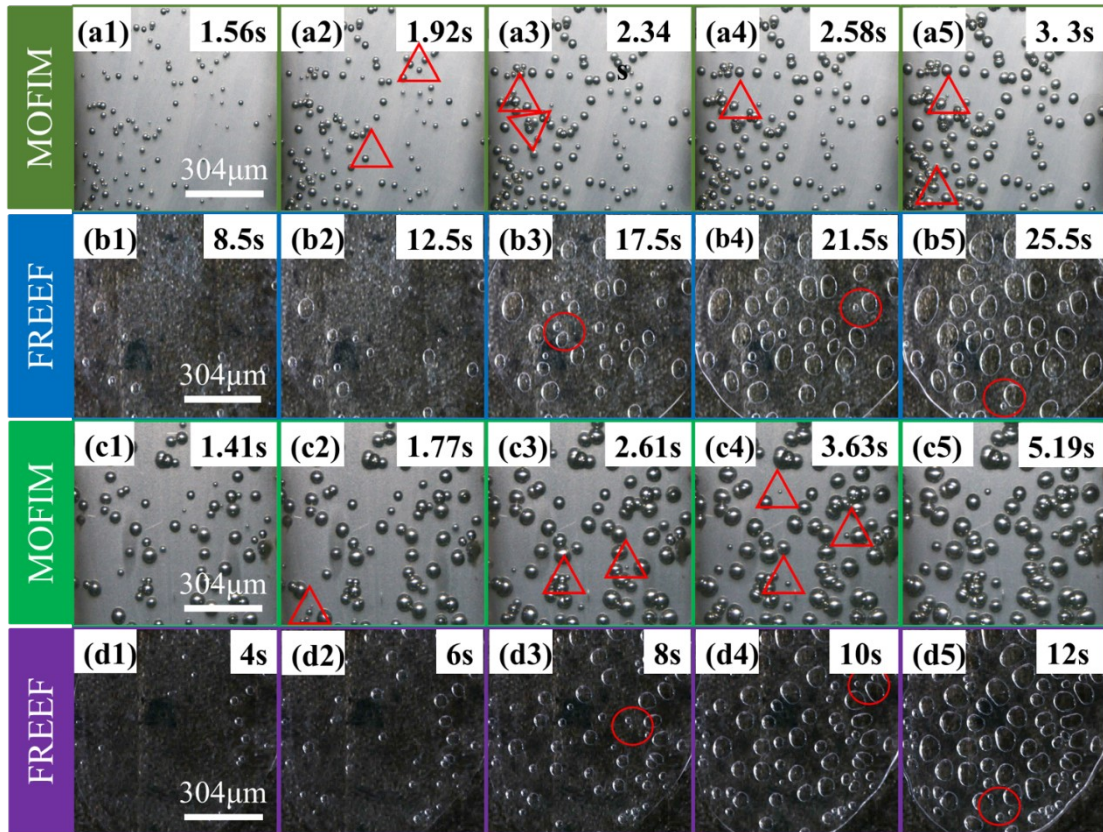


Fig.S1. Visual observation images of secondary bubbles at different melt temperature: (a) MOFIM+200°C, (b) FREEF+200°C, (c) MOFIM+220°C, (d) FREEF+220°C.

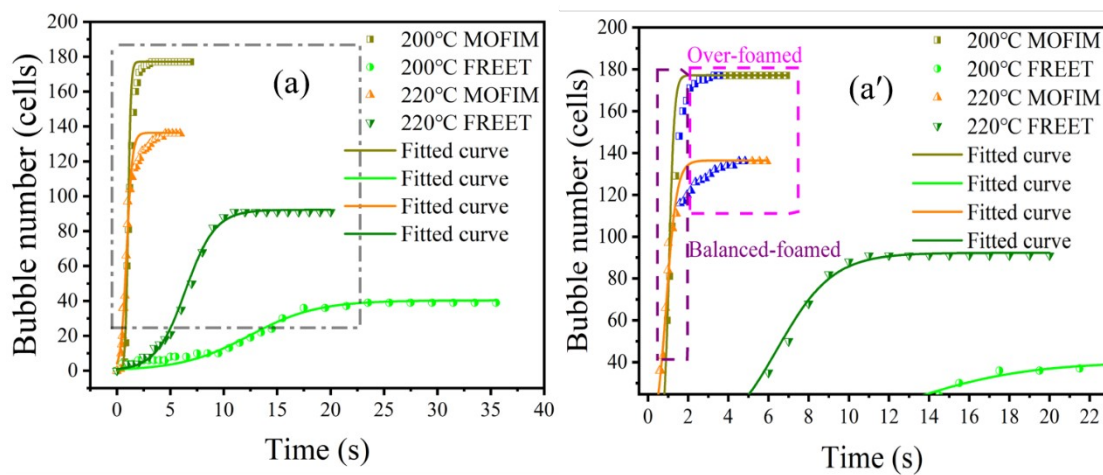


Fig.S2. (a and a') Fitting curve of experimental and fitted values under 200°C and 220°C melt temperature.

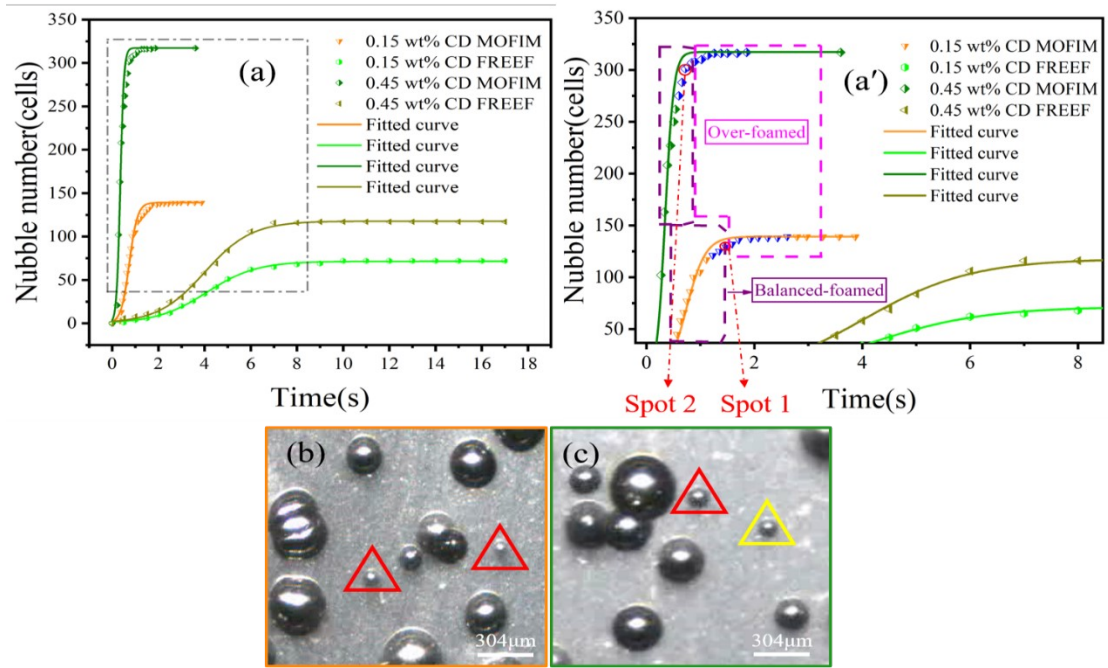


Fig.S3. (a) and (a') are the N-t curves of experimental and fitted values, (b) the visual video screenshots of spot 1, (c) the visual video screenshots of spot 2

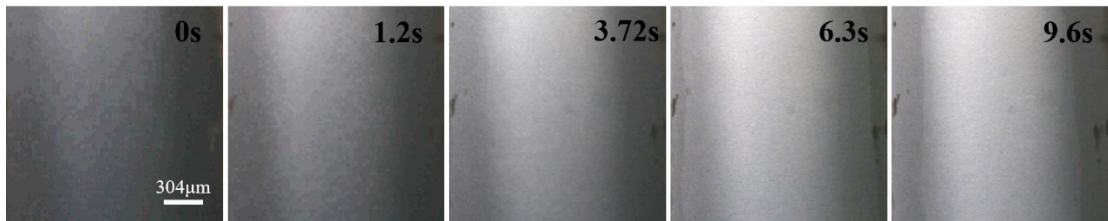


Fig.S4. The screenshot of the visualization video with a mold opening time of 25 s.