

Low-Temperature ZnO Nanowire Growth on Inkjet-Printed Seed Patterns

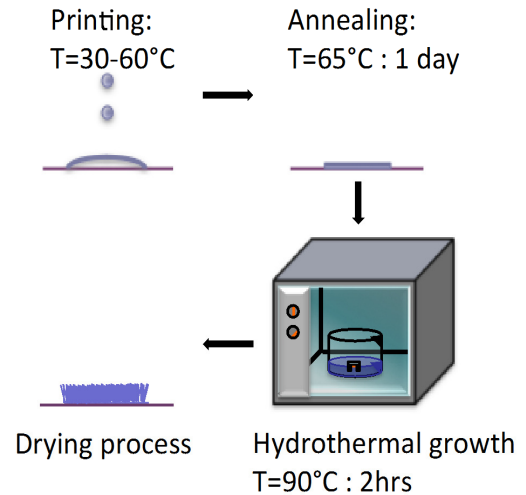
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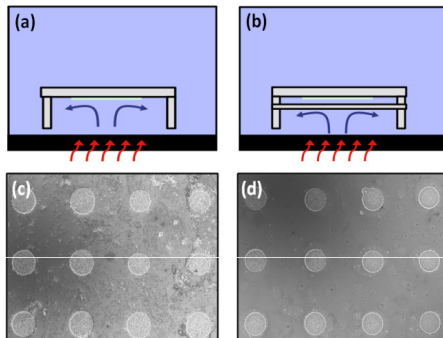
Introduction

- This technique suggests inkjet printing the desired pattern as seed layer, followed by annealing and then hydrothermal growth of nanowires; Reducing both fabrication cost and time.
- The smallest printed feature relies on the droplet size, which in this case is about $80\mu\text{m}$.
- Controlling factors like Temperature, number of printed layers and dot spacing can dramatically affect the nanowire patterns.

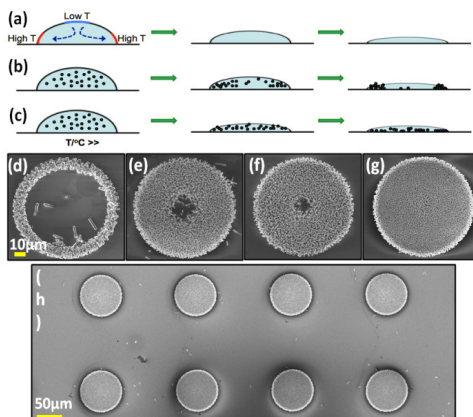


Results and Discussions

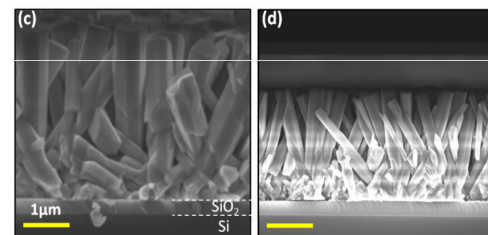
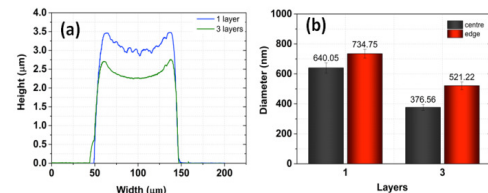
- Pattern quality improvement by confinement of convective flow:



- Higher Temperature reduces coffee-stain effect:



- Increasing the number of layers results to shorter and narrower nanowires:



Conclusion

- Coffee-stain mechanism can be successfully adjusted so that it can vary the fill factor of nanowires of a dot pattern from an empty one up to a full one.
- Printing more than one layer does lead to higher concentration of nanowires but also hinders their growth.