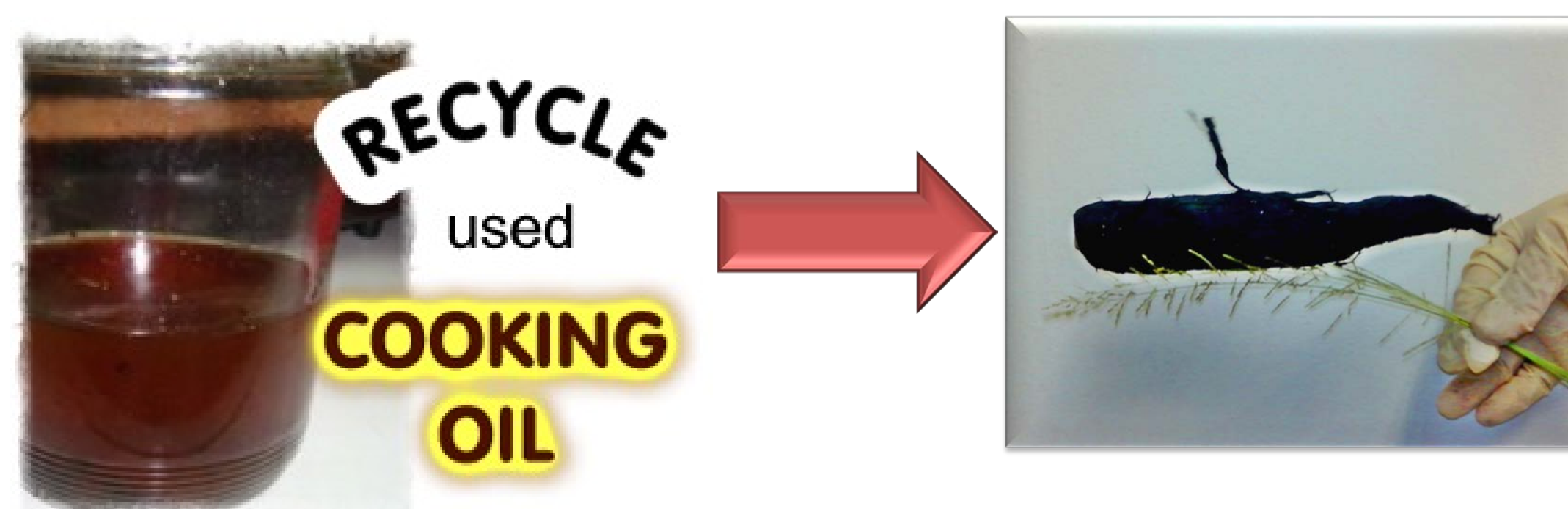


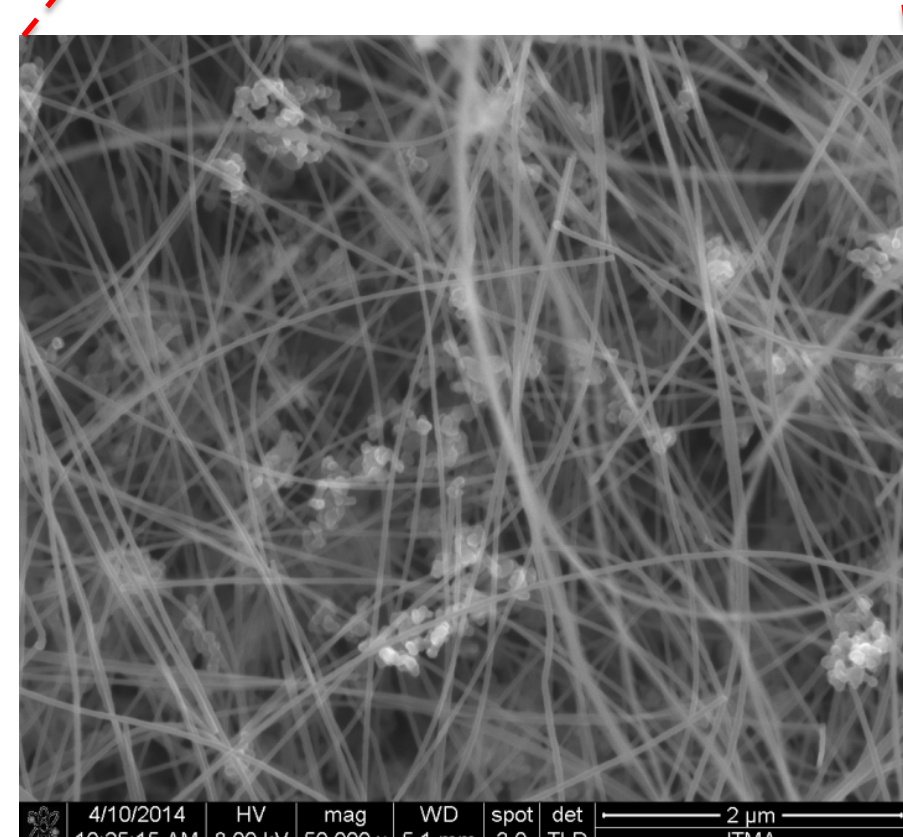
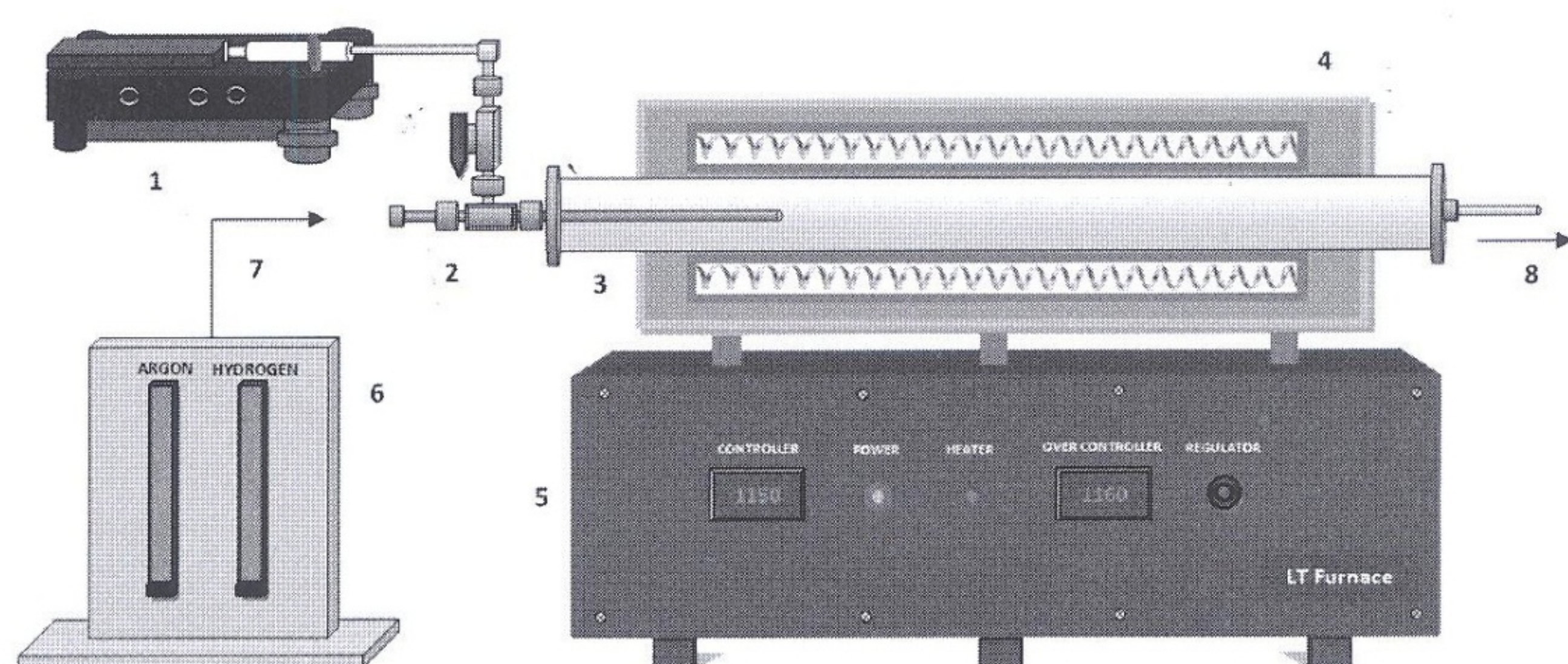
# Bio-based Carbon Nanotubes (CNT) Superfiber Materials

(PI 2016700749)

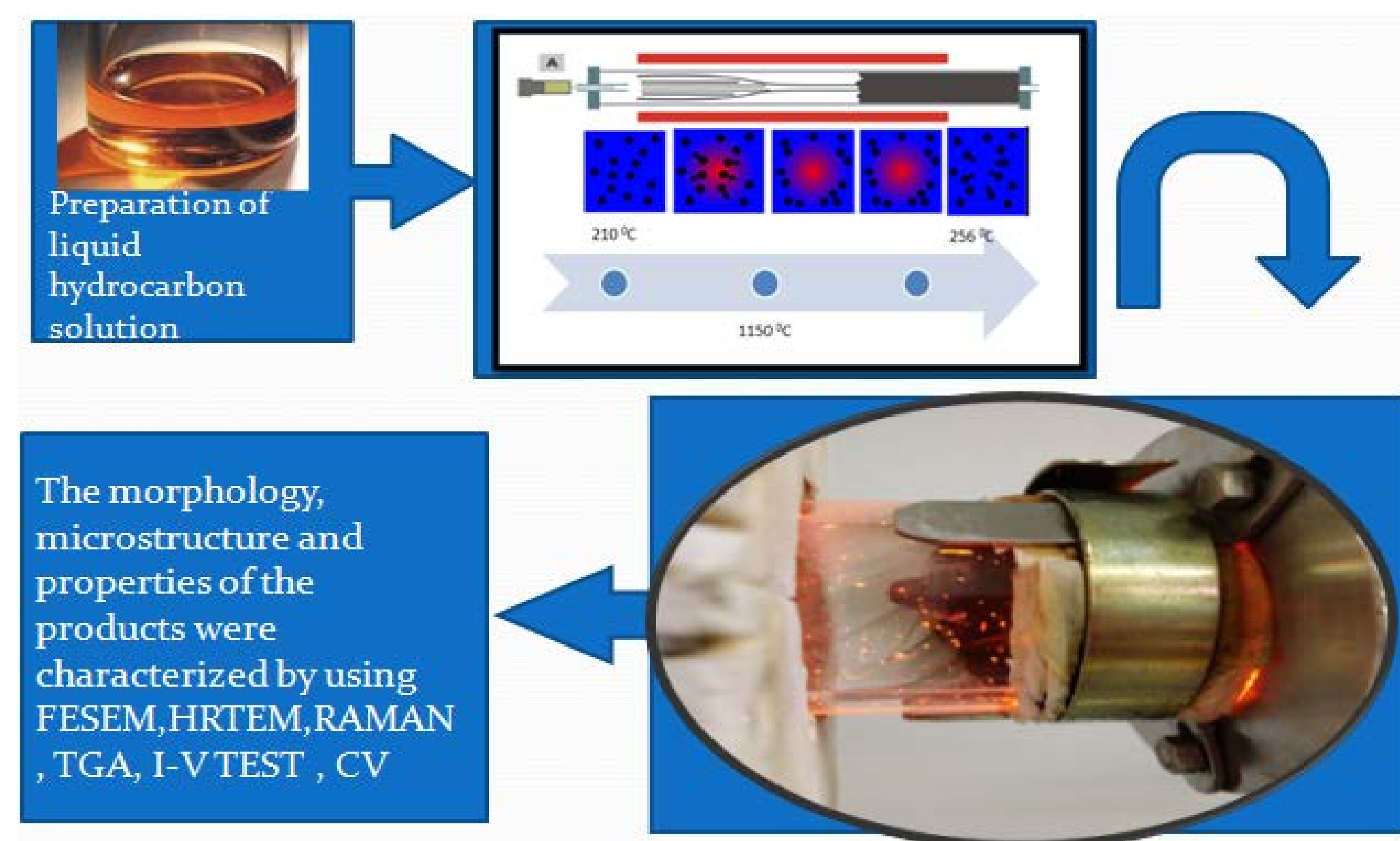


## INTRODUCTION OF TECHNOLOGY

Fiber is possibly the first form of material that humans ever worked, though this would be hard to prove given the ephemeral nature of the natural product. Over 30 thousands years ago, the twisting weaving and dyeing of flax and tur (goat) hair was already established. **Nanotube superfiber materials** refers to a family of forms of nanotube fibrous materials that have a unique suite of functional properties. Different forms of superfiber materials include nanotube arrays, ribbon, scrolls, yarn, braid, fabric, tape and sheet. These materials have combinations of properties not available in existing materials. Since individual nanotubes cannot be produced as continuous materials yet, methods are needed to form macroscale and bulk materials from short nanotubes.



- Temperature : 1150 °C
- Carbon source : Waste cooking oil
- Catalyst : Ferrocene
- Promoter : Thiophene
- Carrier gas : Hydrogen
- Injection flow rate : 10 ml/h

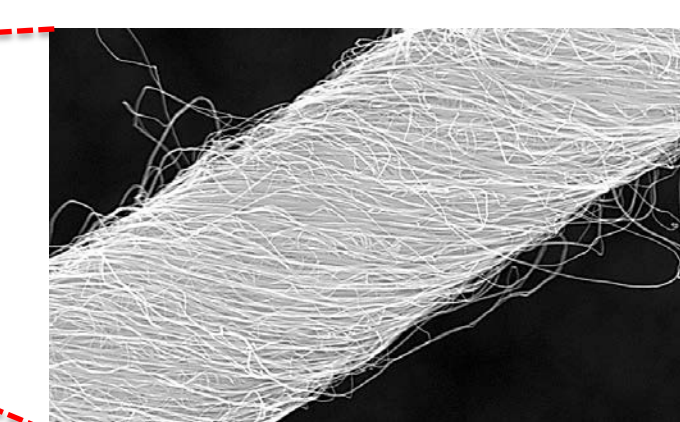


## INVENTION

Most of the current bulk form of CNT is in the form of powders or thin/thick film causing the difficulty in handling. Easily used formats are not available to be used in the industry. Since individual CNT cannot be produced as a continuous material yet, methods are needed to form macroscale and bulk materials from short CNT. We have successfully invented a nanotube superfiber materials in the bulk-form of cotton, tape and sheet made from cheap and abundance waste cooking oil.

## BENEFITS/ ADVANTAGES

- The raw material is purely a regenerative material
- use of waste cooking oil as the starting material for the synthesis of bio-based CNT cotton/tape/sheet,
- Less hazardous chemical synthesis
- Bio-based CNT cotton/tape/sheet offers easy processing, manipulation and design of desired structures



**Project Leader** : Dr. Ismayadi Ismail  
**Dept./Faculty** : Institute of Advance Technology  
**Email** : ismayadi@upm.edu.my  
**Phone** : 03-89467546/012-3510091  
**Expertise** : Magnetic materials, Nano materials, Microwave absorbing materials

[www.sciencepark.upm.edu.my](http://www.sciencepark.upm.edu.my)