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The Internal Structure of Modern Wood and Plastic Fibre Insulation Materials



Wood fibre insulation materials

- Advantages

- 95% wood-based



- Low irritation

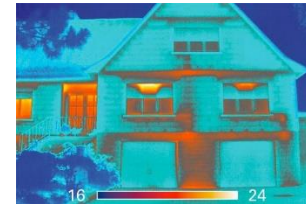


- Humidity control

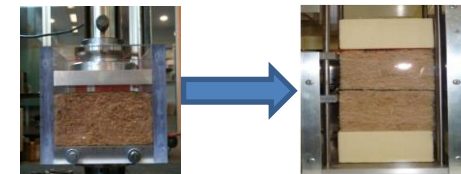


- Improvements

- Thermal performance



- Thickness recovery

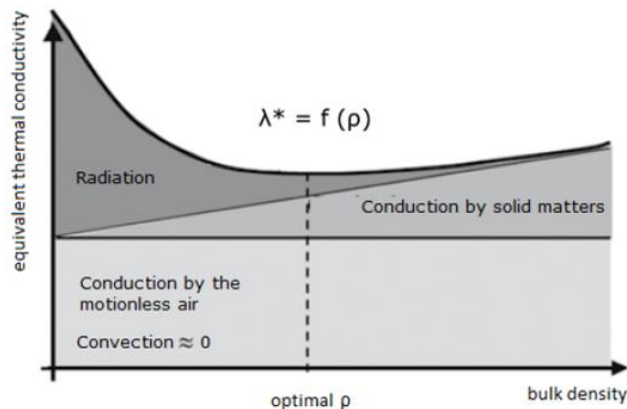


- Cost

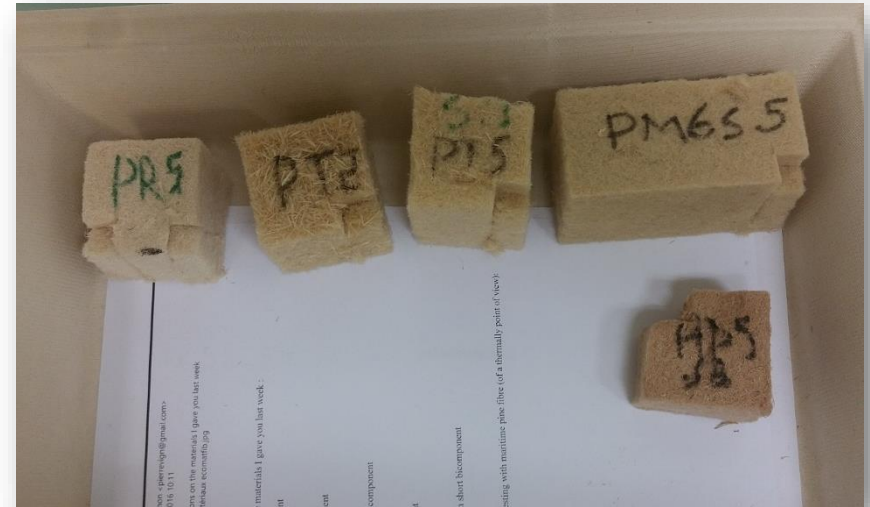


General approach

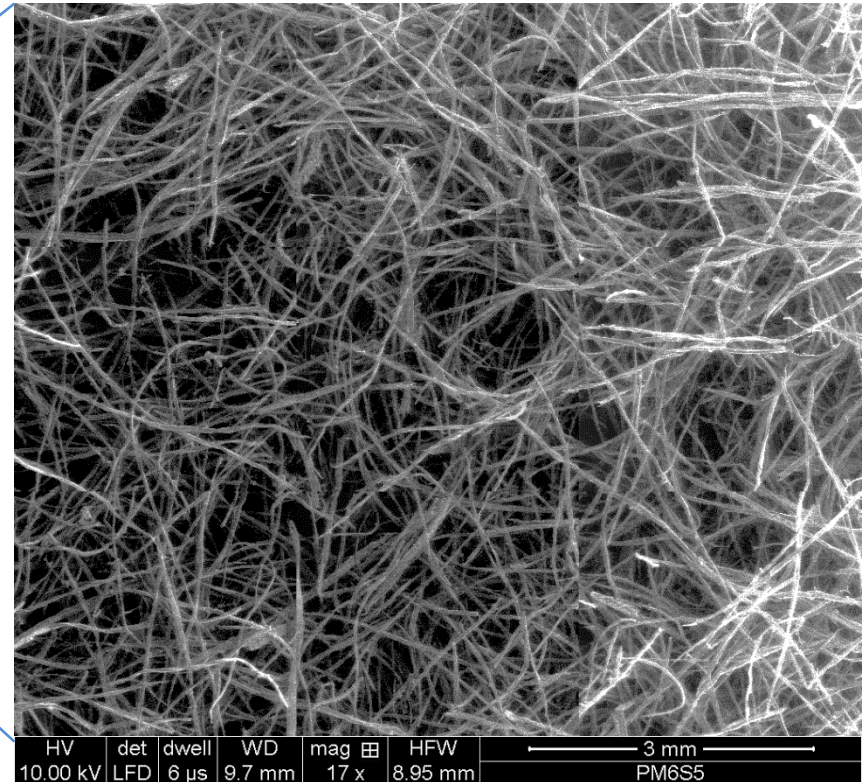
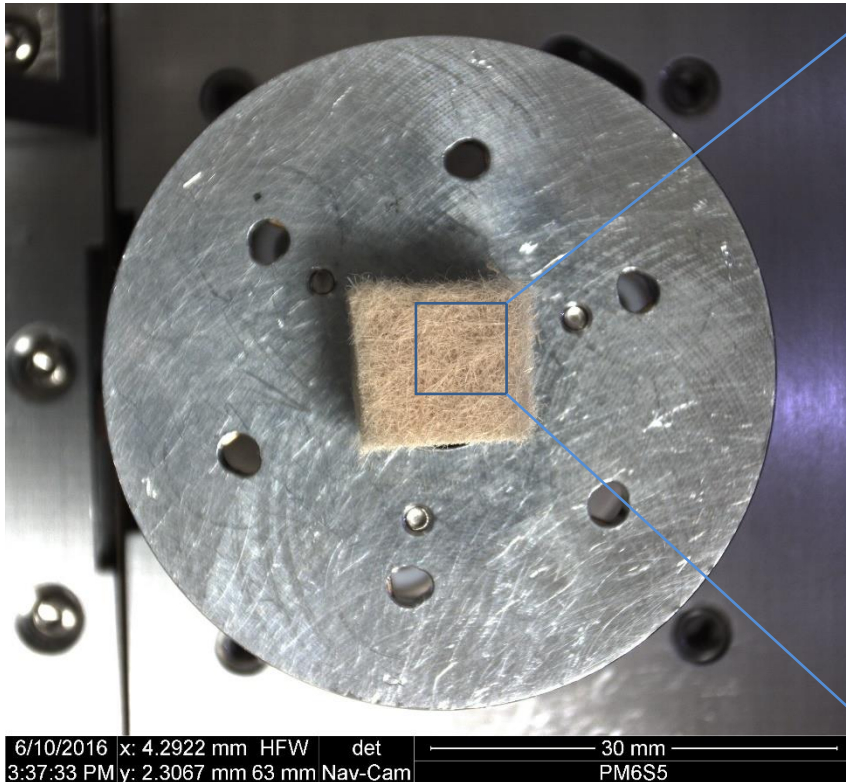
- Fibre size
- Plastic fibre
 - Type
 - Length
- Bulk density



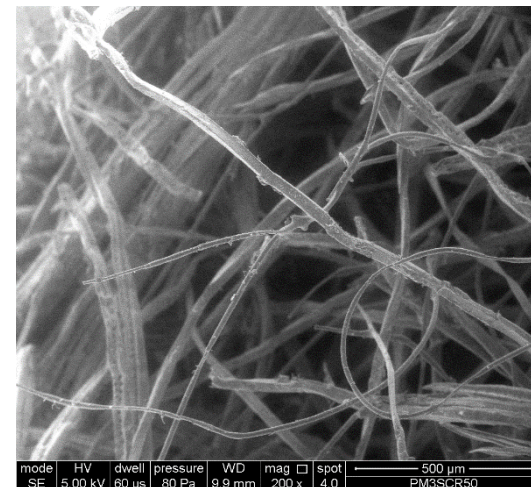
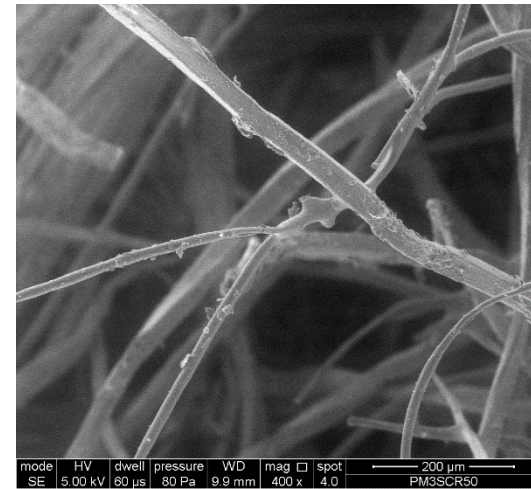
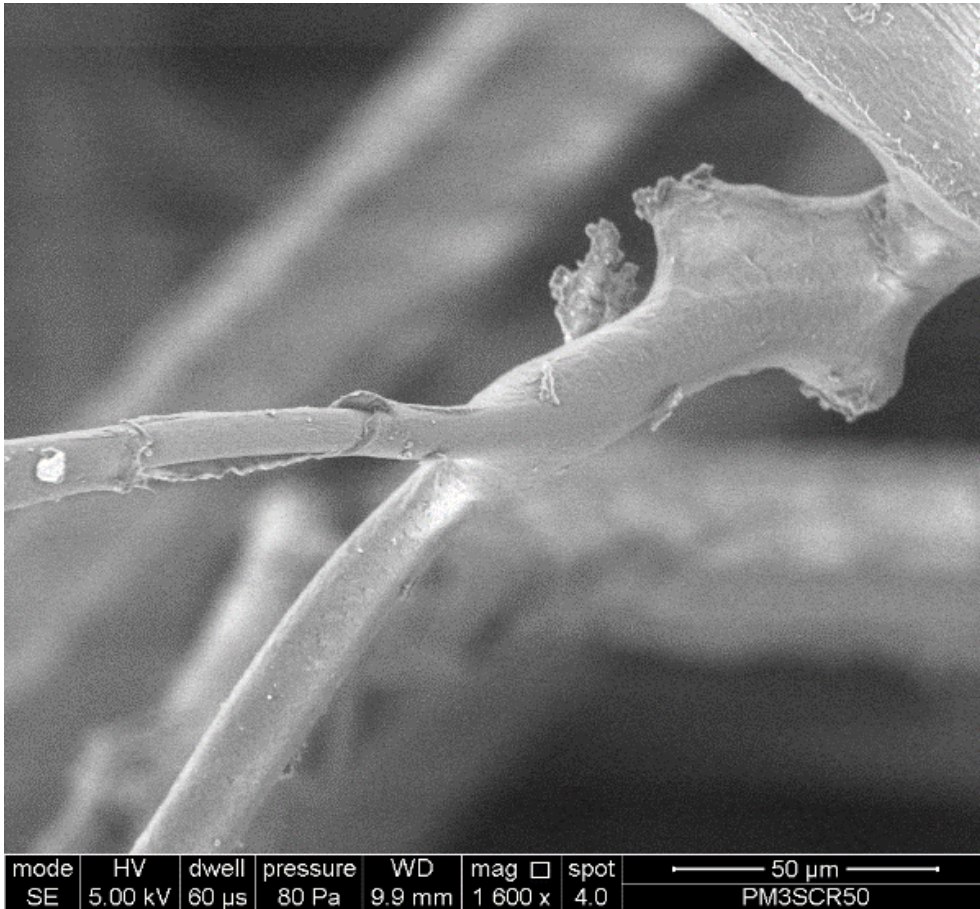
Evolution of the equivalent thermal conductivity function of the bulk density of insulating materials (Coquard, 2012)



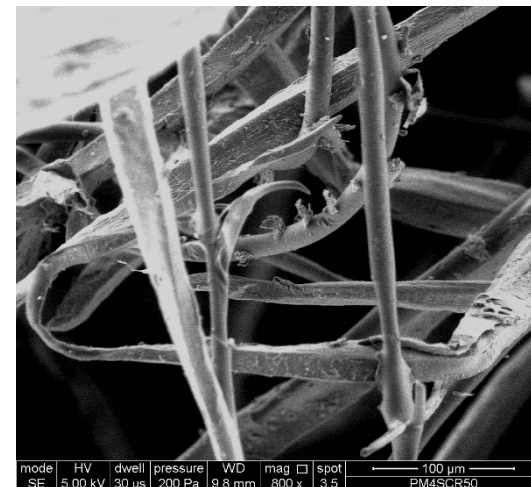
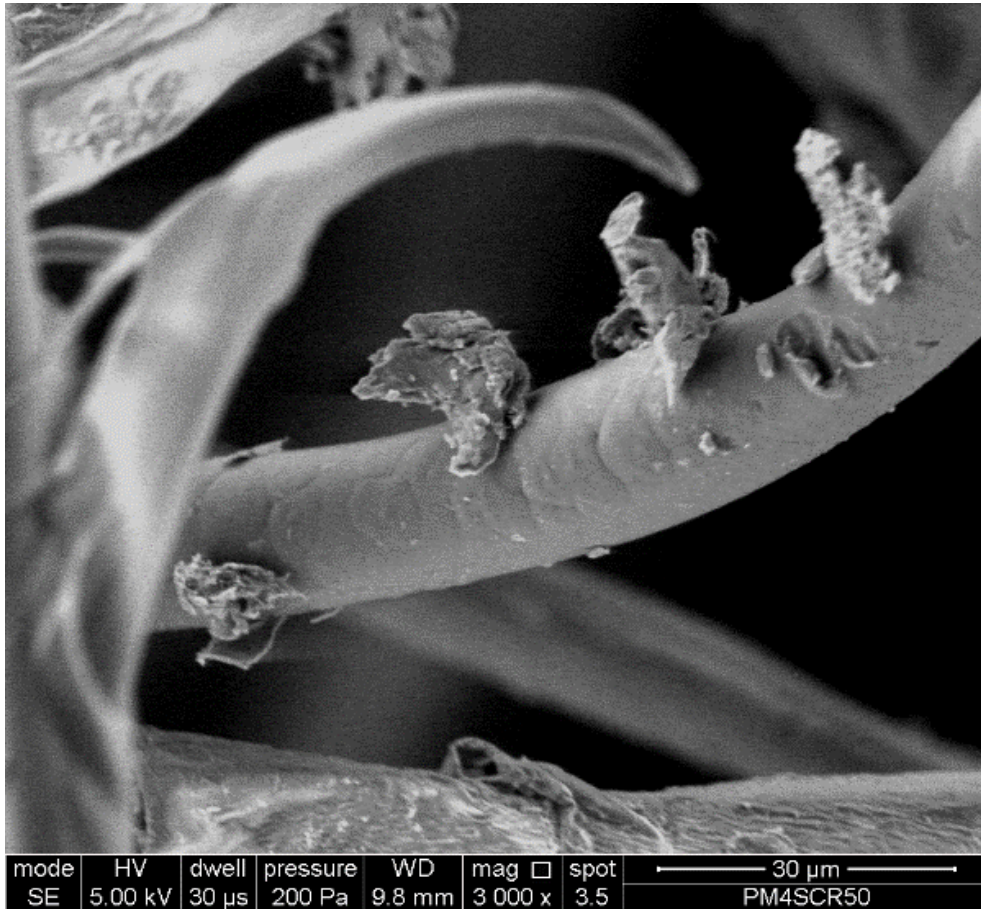
Navigating samples



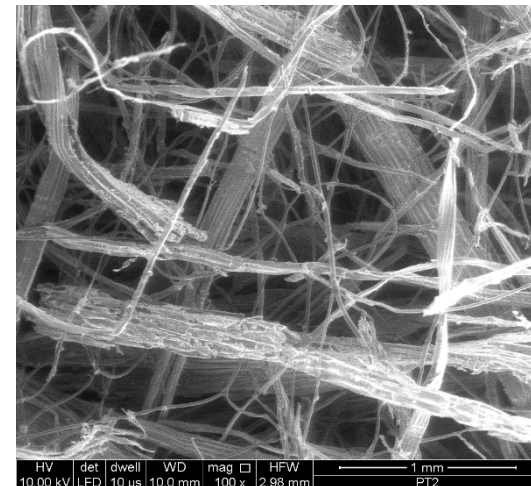
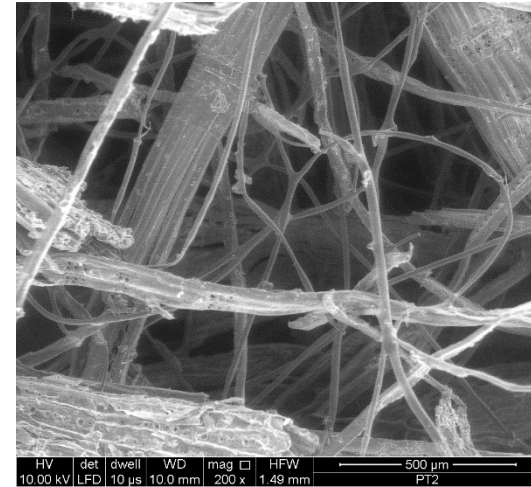
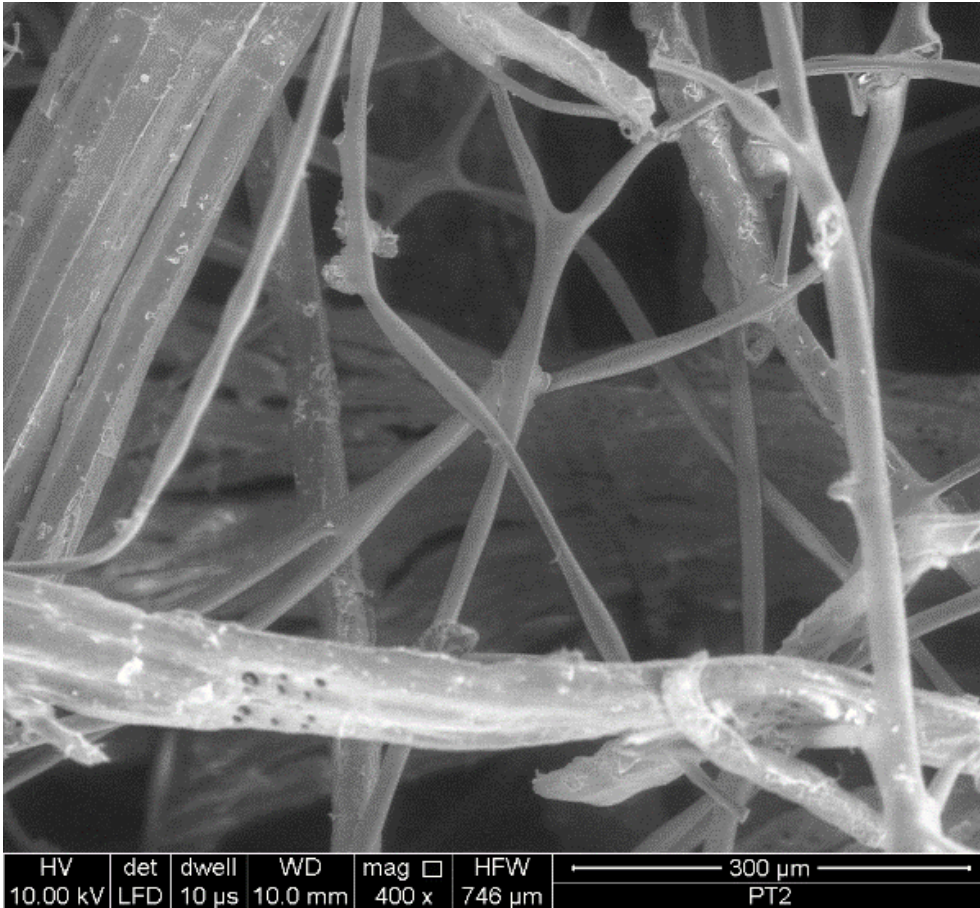
Example of plastic structure



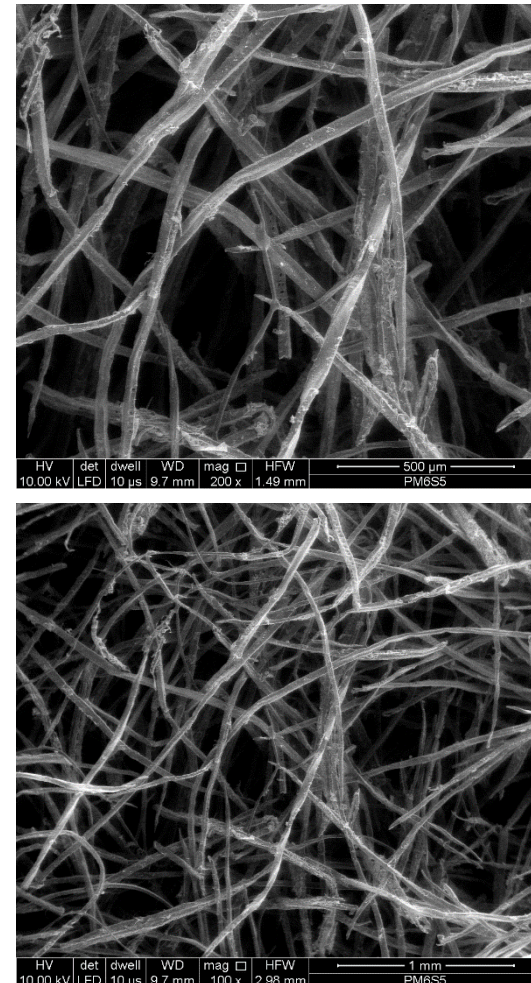
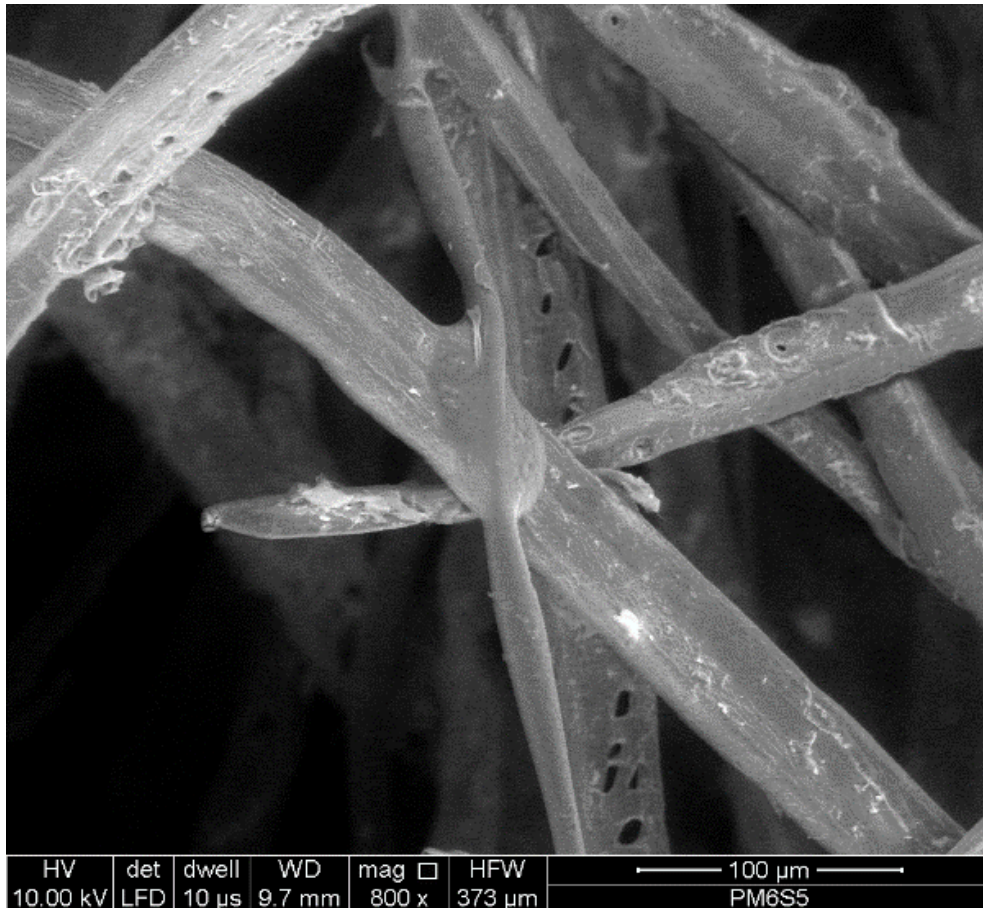
Outer coating very sticky



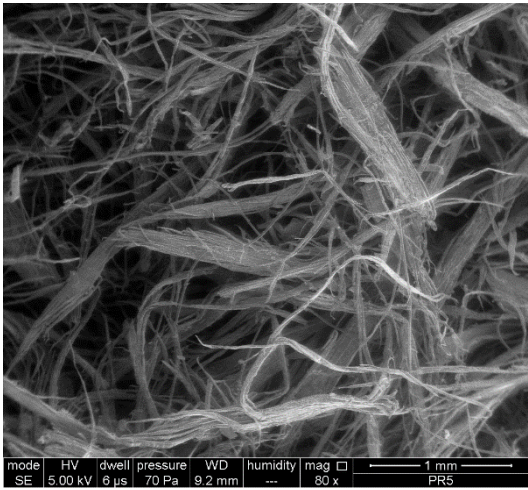
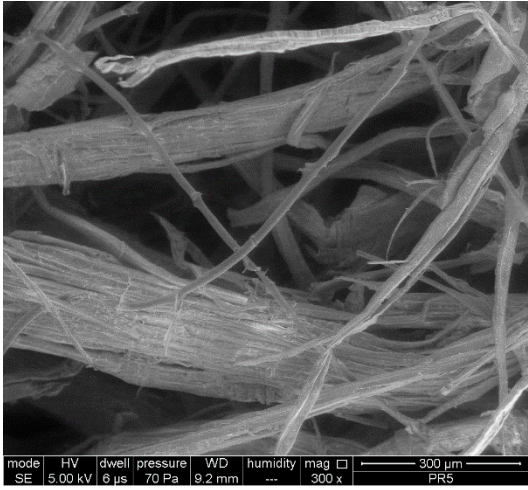
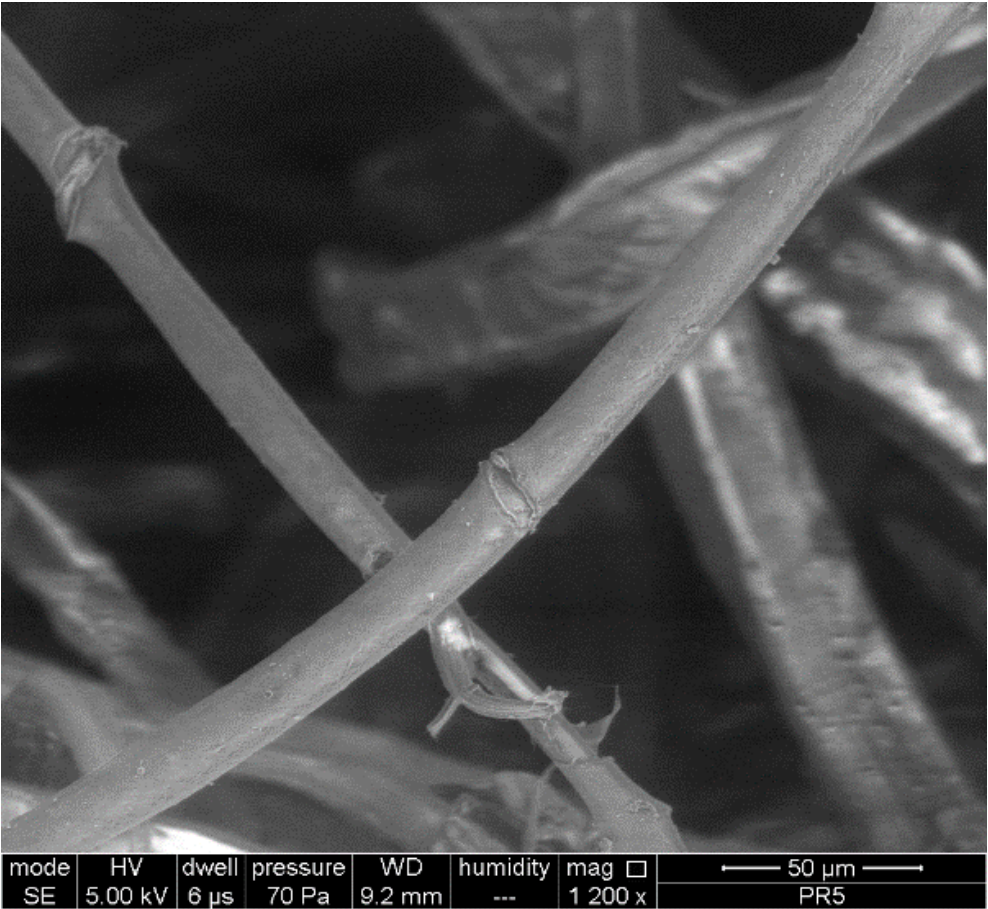
Plastic fibre diameter changes at junctions



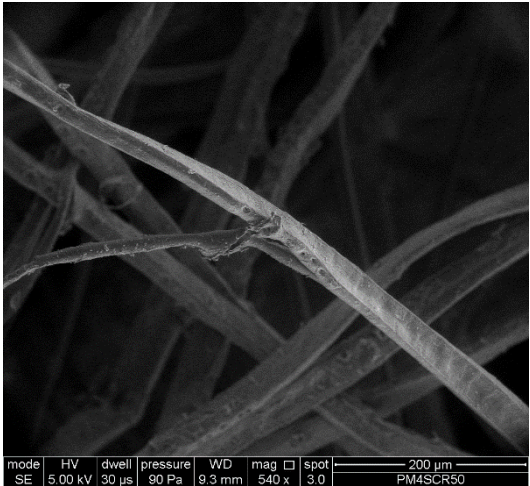
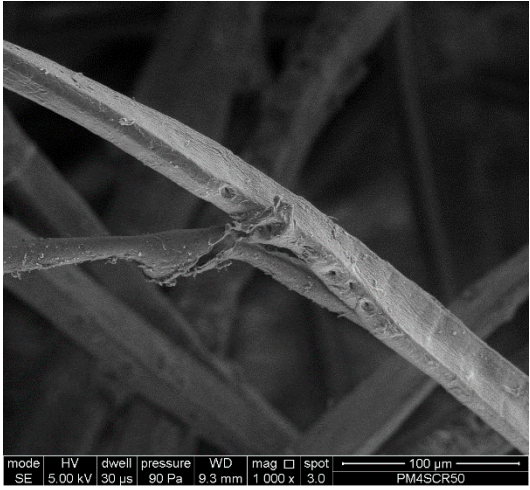
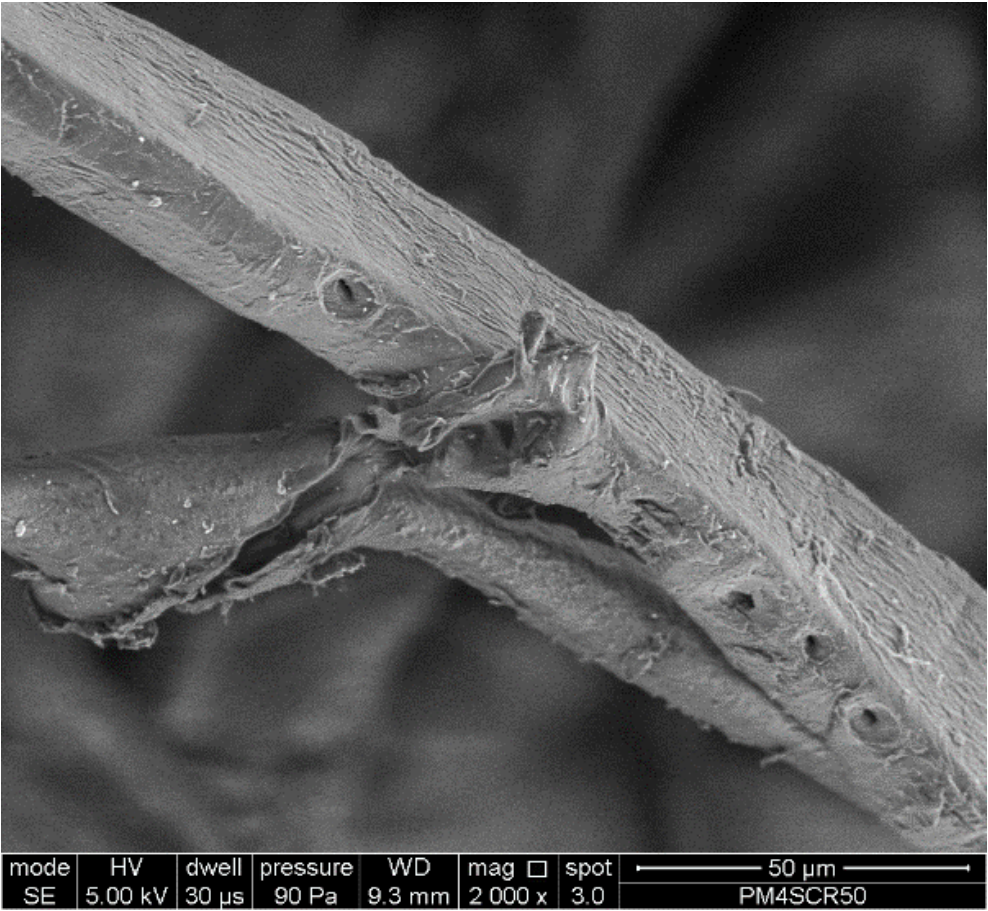
Plastic flows on contact with wood fibre



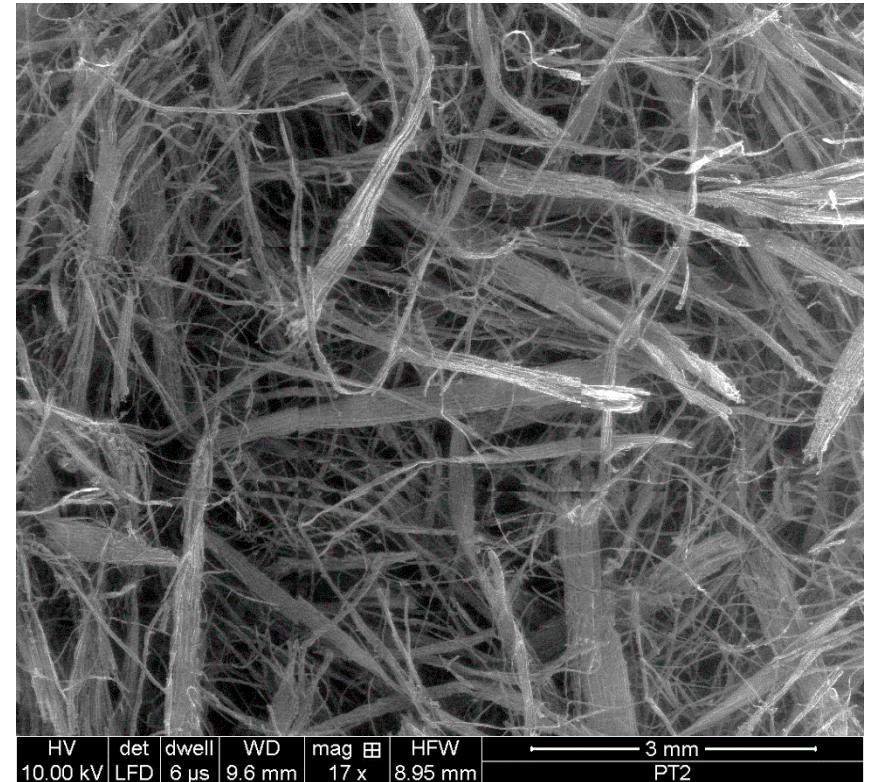
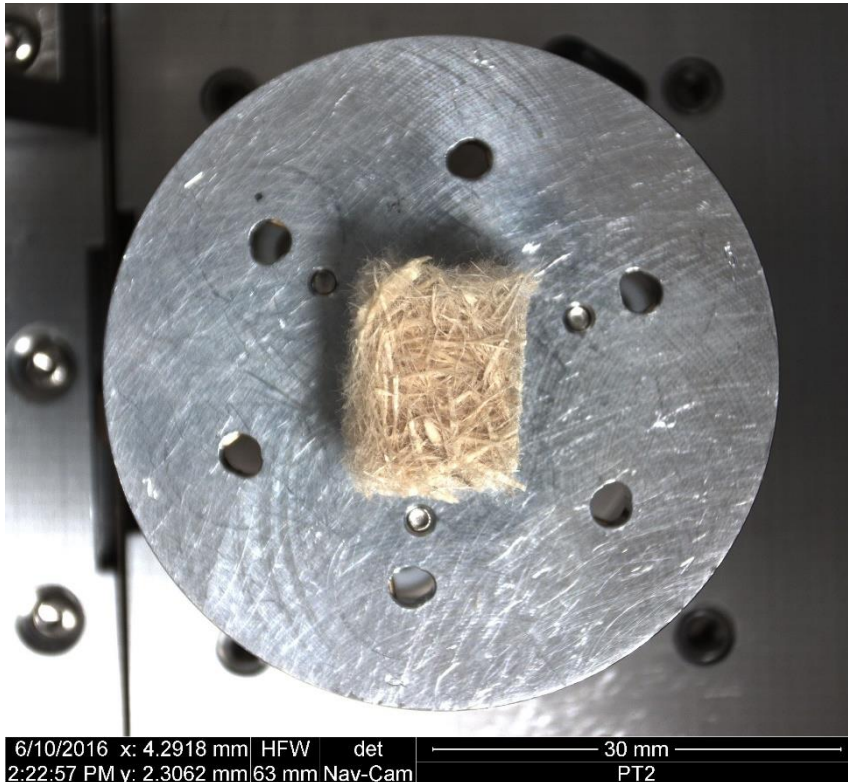
Bond rupture: plastic side



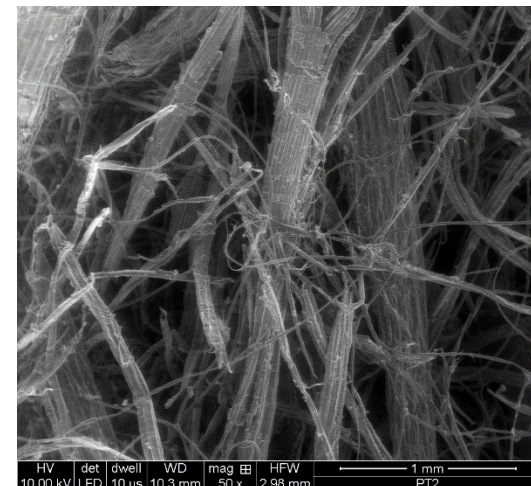
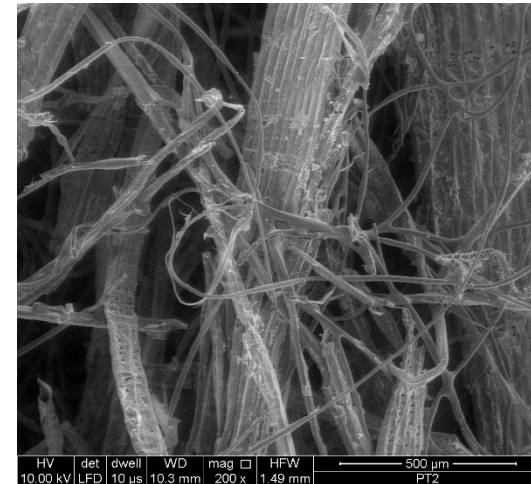
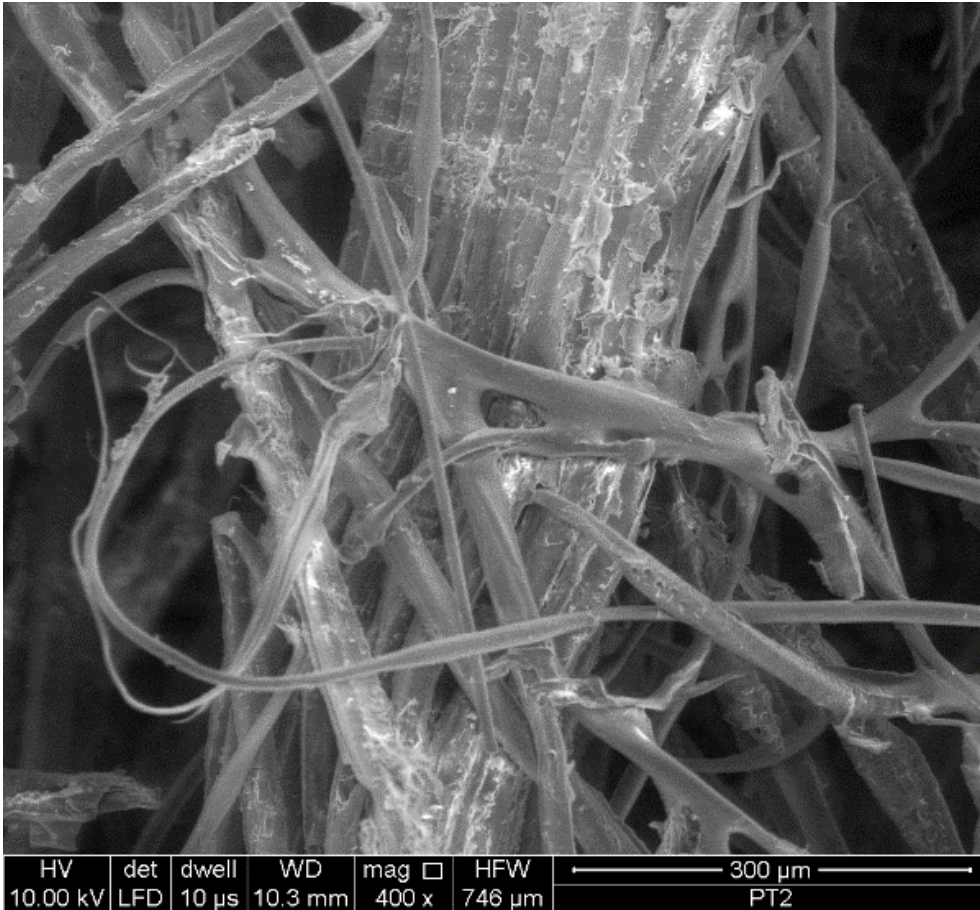
Bond rupture: wood side



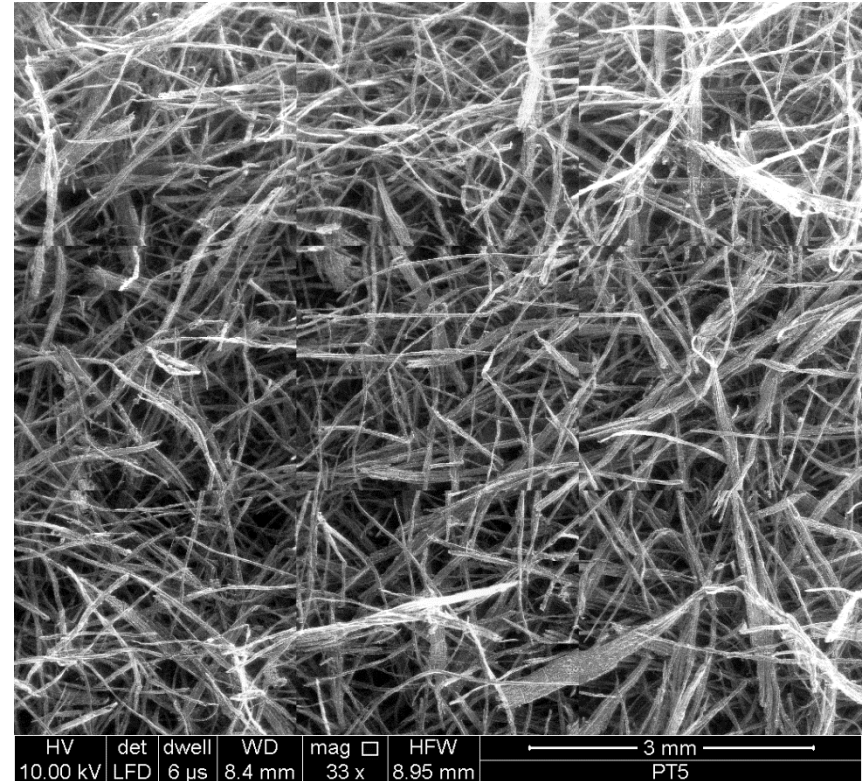
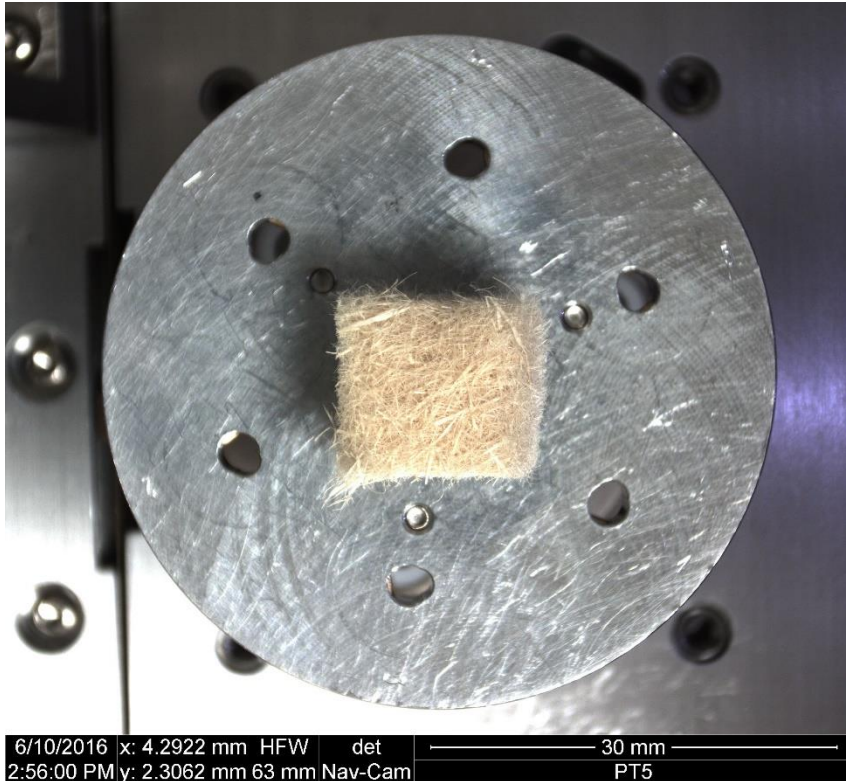
Coarse fibre example



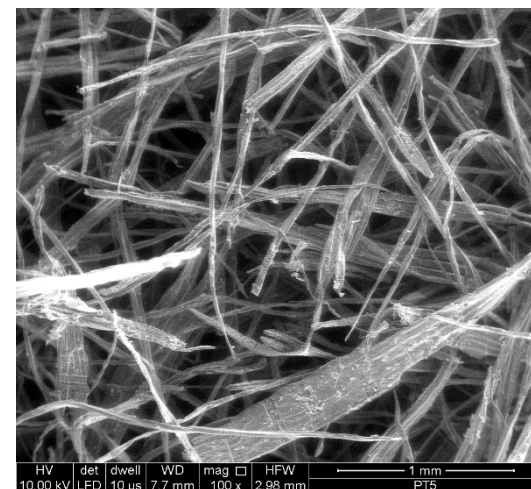
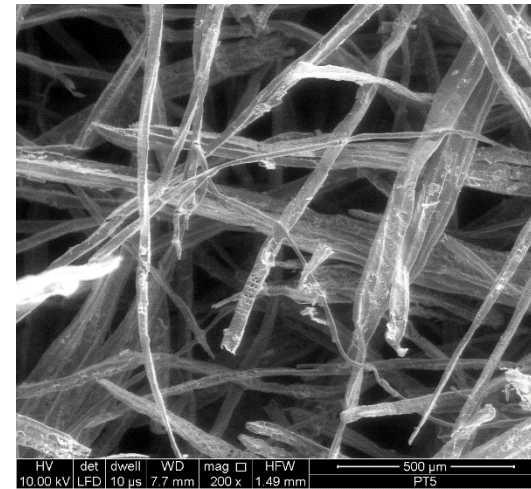
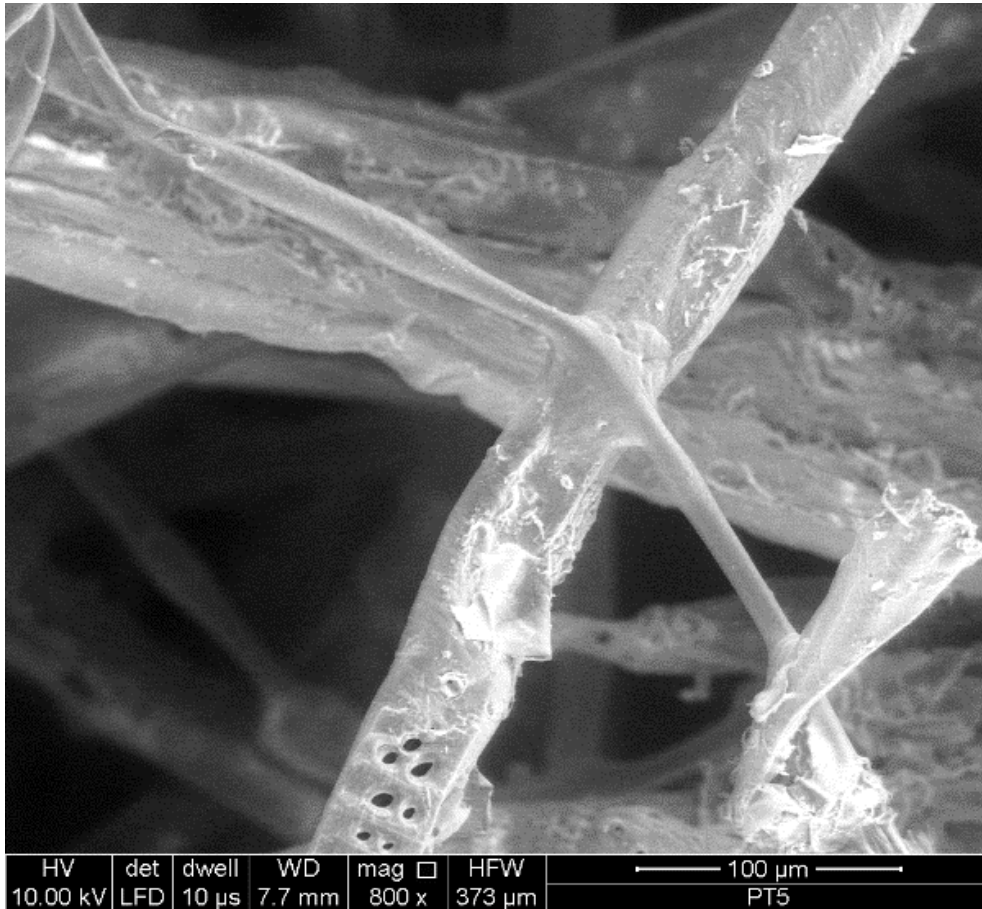
Coarse fibre close-up

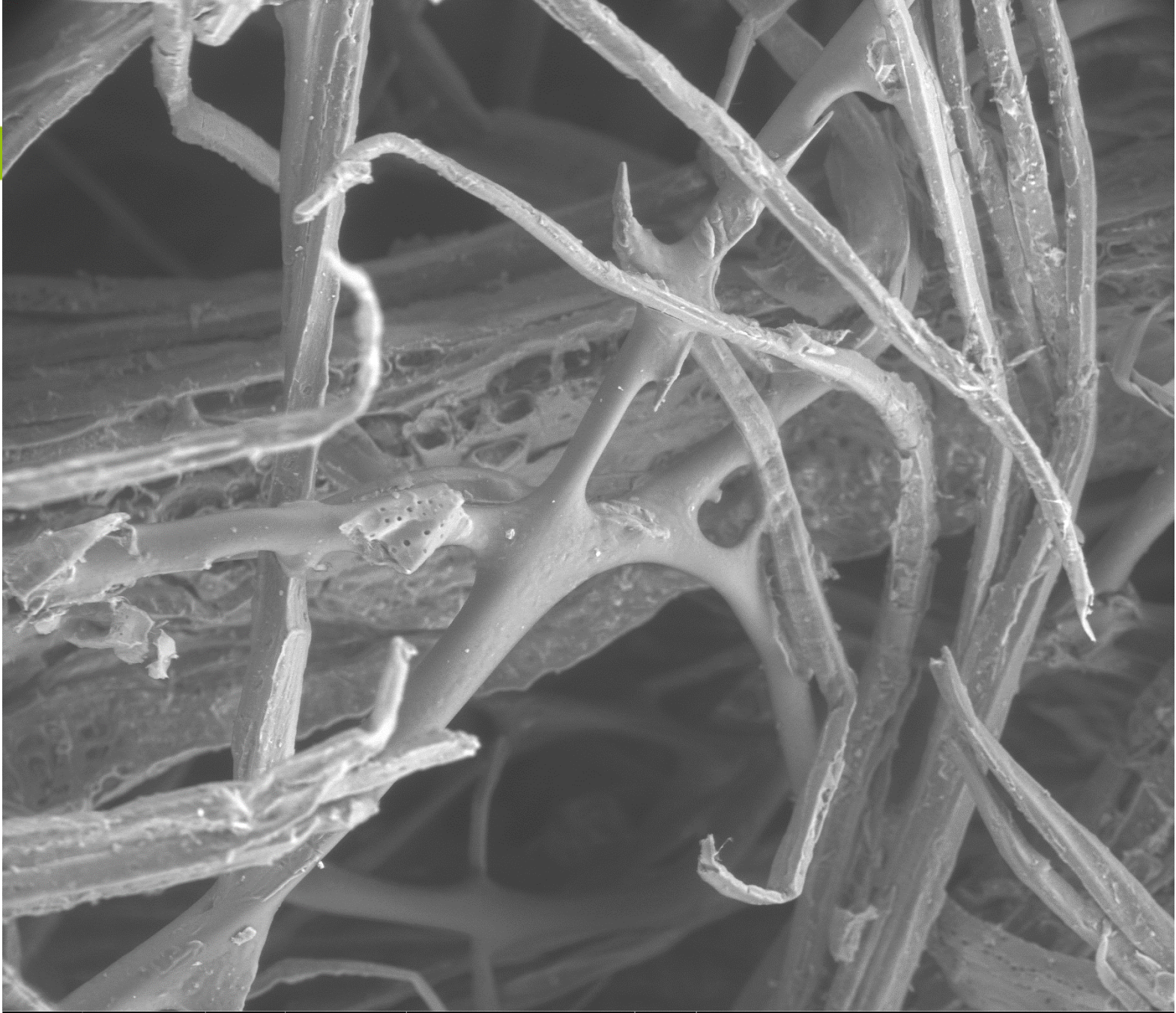


Fine fibre



Fine fibre close-up





mode	HV	dwell	pressure	WD	mag	spot
SE	10.00 kV	30 μ s	300 Pa	10.0 mm	700 x	3.5

100 μ m
HP5S8



Conclusions

- ESEM images indicate that melted plastic accumulates at
 - Wood fibre-plastic junctions
 - Plastic-plastic junctions
- Probably due to surface tension effects?