



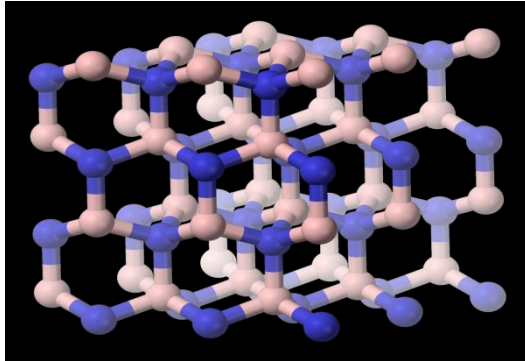
# **Nanoboron nitride in enhancing thermal properties of the cellulose fibers**

**Deniz Aydemir, Nurgül Tankut**

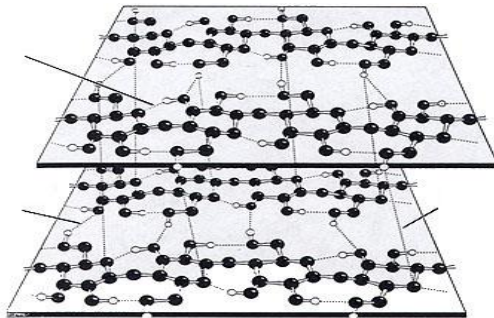
*Bartın University, Faculty of Forestry  
Department of Forest Industry Engineering*

**COST FP1303 : March 2015 Tallinn, Estonia**

# Objectives



hNBN

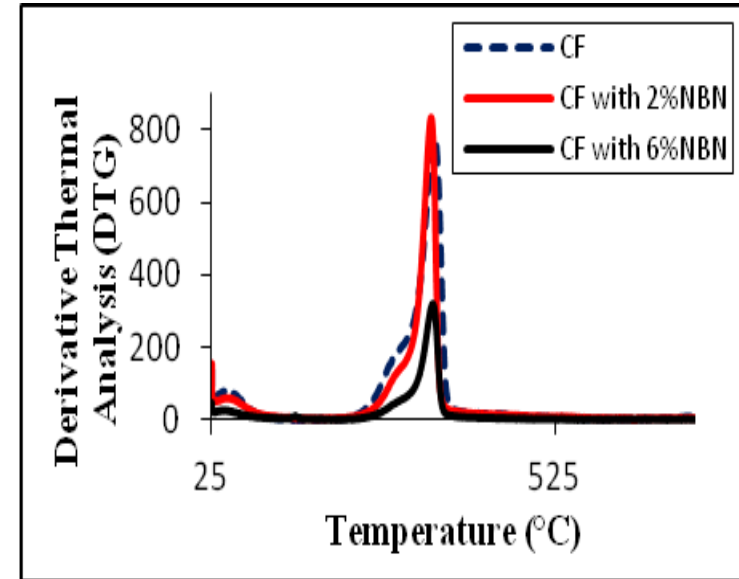
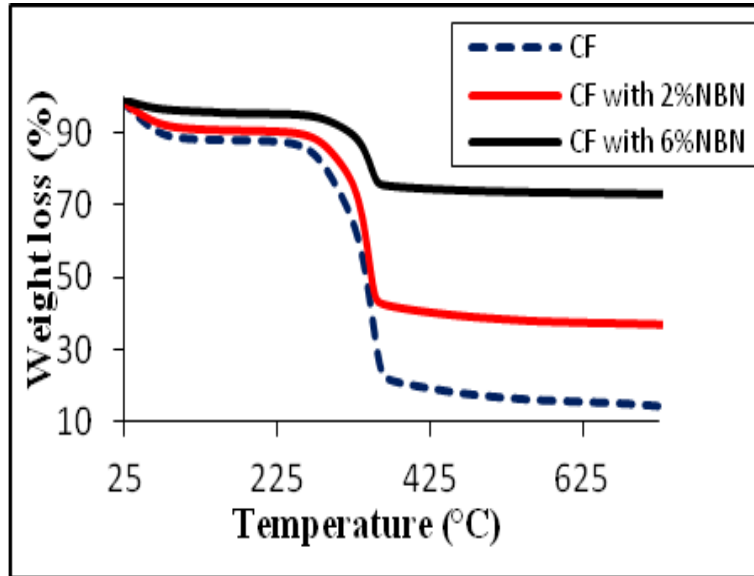


Cellulose fibers

Cellulose fibers have been used to manufacture many materials. But they have low thermal stability.

In order to enhance the thermal stability, cellulose fibers were modified with nano-sized nanoboron nitride. Also, interactions between the cellulose fibers and hNBN particles were investigated.

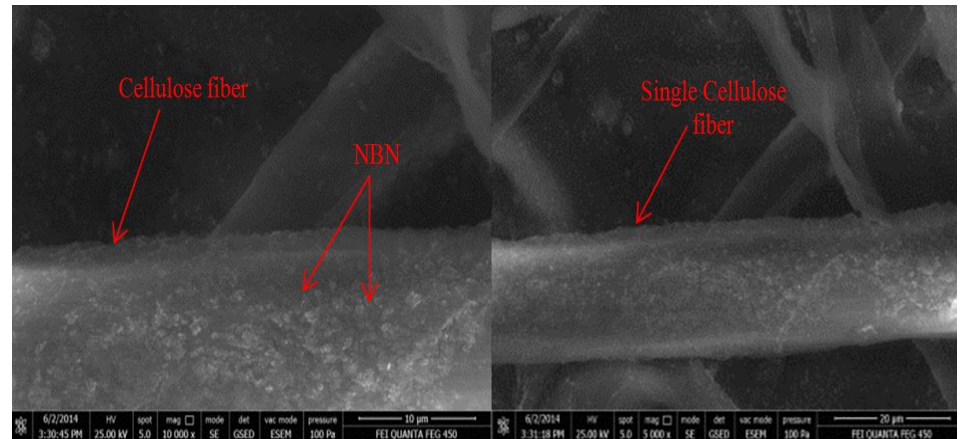
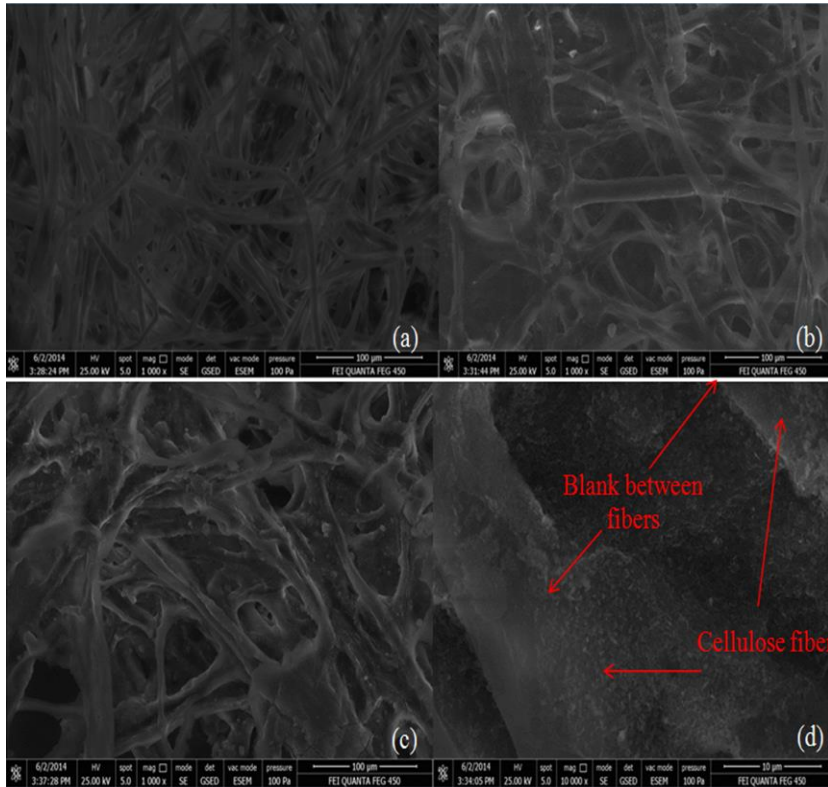
# Thermal stability



Samples	T10% (°C)	T50% (°C)	DTGmax (°C)	Weight loss (%)
CF	75	341	350	87
CF with 2%NBN	254	378	345	64
CF with 6%NBN	322	> 725	347	27

Thermal Properties of the NBN modified cellulose fibers

# Morphological characterization



Biocomposites with different loading rates of hNBNs

# Conclusions

- ❖ Thermal properties were found to increase with NBN loading. The highest thermal stability was determined for CF+6%NBN.
- ❖ The morphological characterization changed with loadings of NBN. NBN addition was found to fill blanks between CFs. Therefore, surface smoothness of biocomposites sheets was found to increase.

## Acknowledgements

The support by the Scientific and Technological Research Council of Turkey (**TUBITAK COST Project No: 112R042**) and Project of TUBITAK for undergraduate students (**2209/A**) is gratefully acknowledged.

