The degree of crystallinity evaluated by NIR spectroscopy

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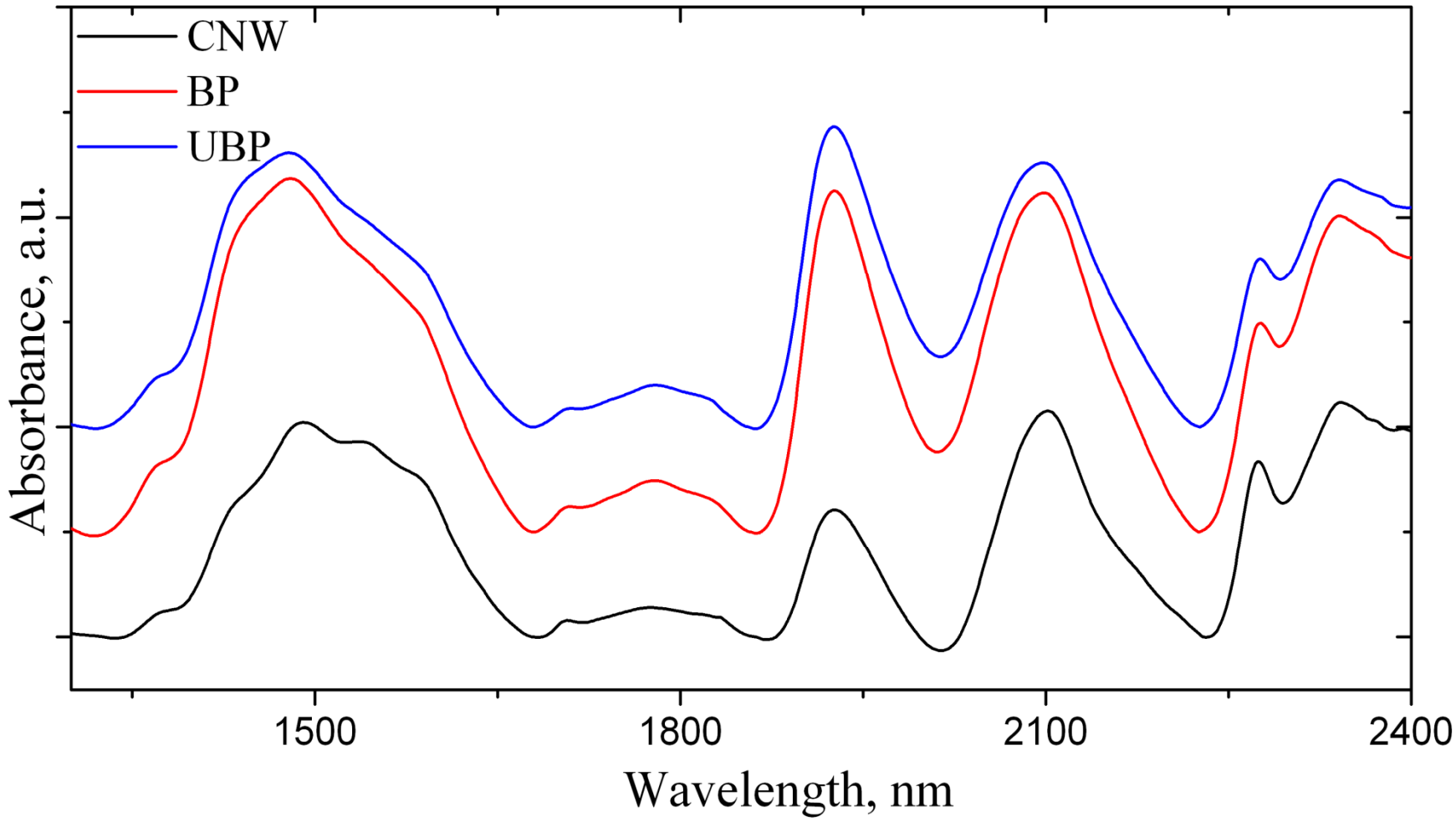
Purpose

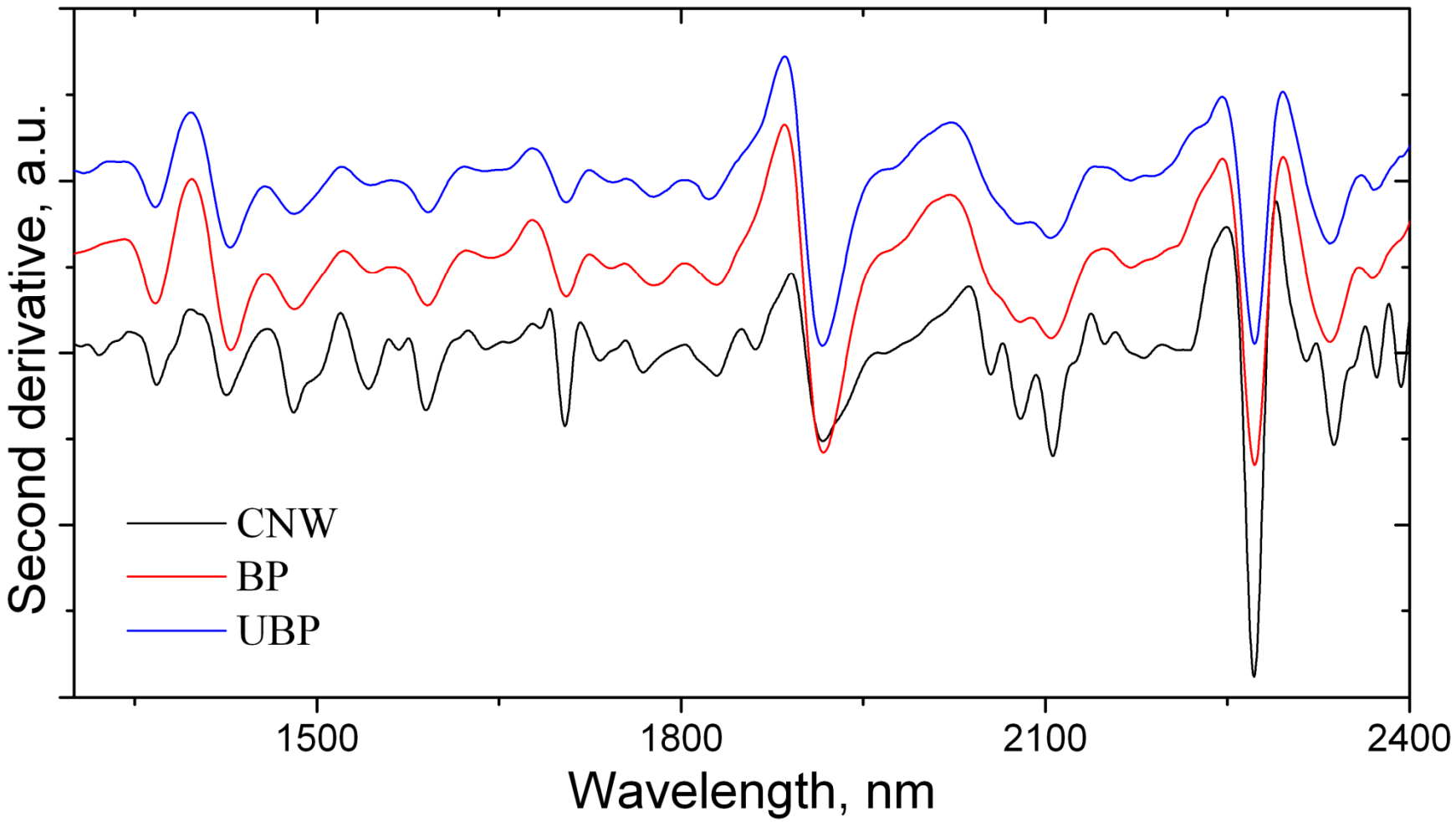
- The evaluation of the crystallinity degree of different cellulosic materials (unbleached, bleached pulp and also cellulose nano whiskers) by using near infrared (NIR) spectroscopy

NIR spectra



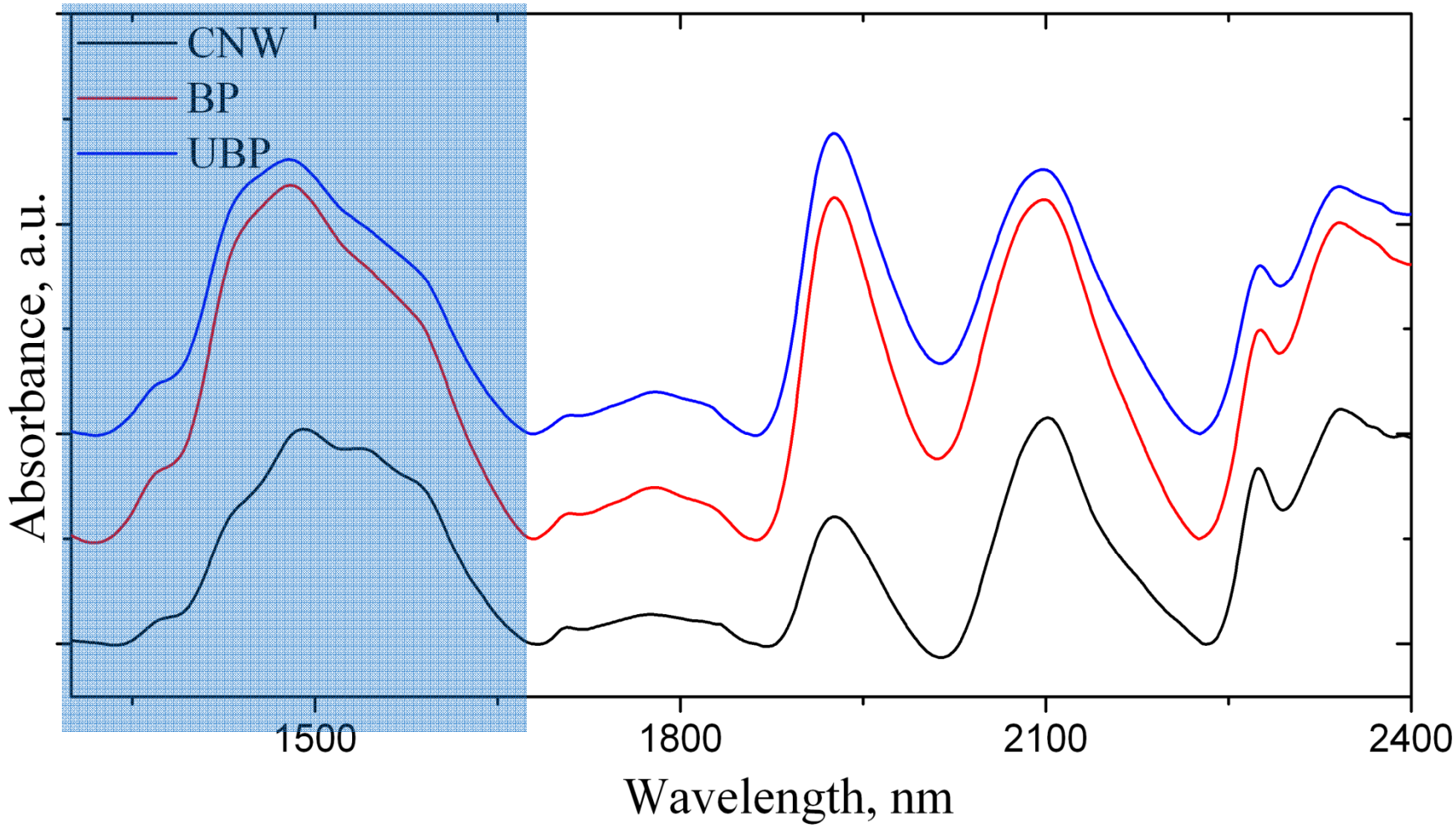
NIR spectra of unbleached, bleached pulp and cellulose nanowhiskers in the 1300 – 2400 nm region

Second derivative NIR spectra



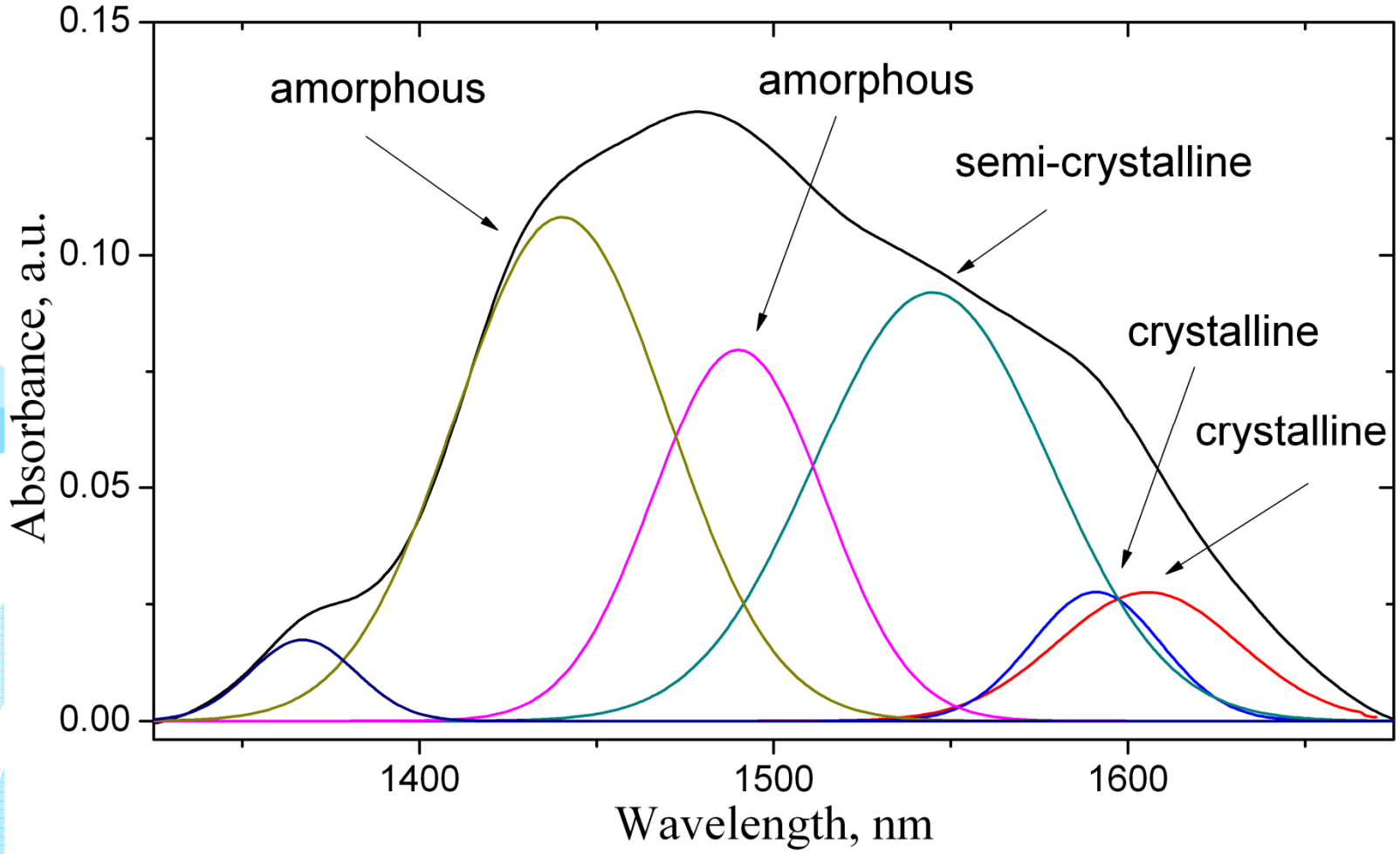
Second derivative of the NIR spectra of unbleached, bleached pulp and cellulose nanowhiskers in the 1300 – 2400 nm region

NIR spectra



NIR spectra of unbleached, bleached pulp and cellulose nanowhiskers in the 1300 – 2400 nm region

NIR spectra



Deconvolution of the NIR spectra of unbleached pulp in the 1325 – 1675 nm region

Conclusion

Sample Method	CNW	BP	UBP
NIR spectroscopy	**78**	**55**	**57**
IR spectroscopy	80	56	58
CP/MAS ^{13}C NMR spectroscopy	----	55	56
XRD	----	59	60