

FTIR ANALYSIS OF THE RECYCLED CELLULOSE FROM THE LABORATORY WASTE MATERIALS VIA REGENERATION PROCESS



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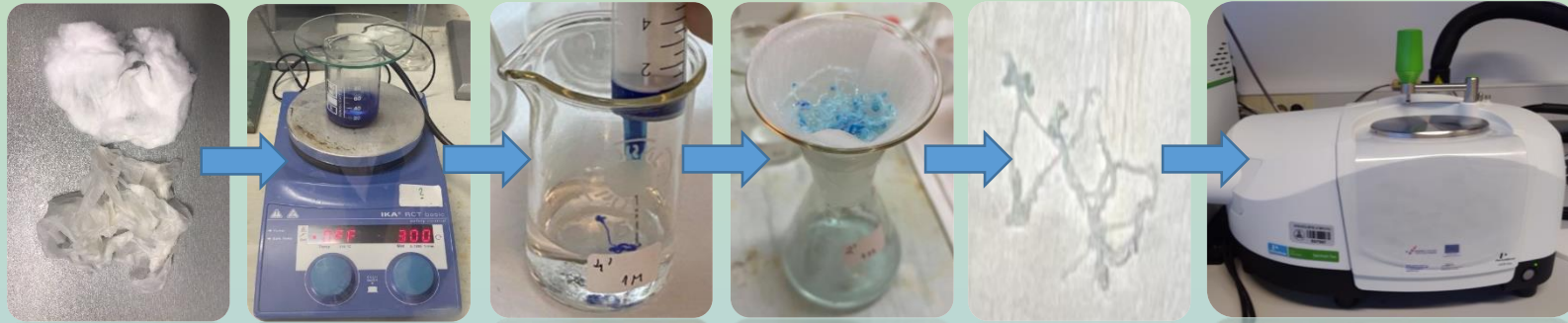


Fig. 1. Cuprammonium regeneration process conducted under different regeneration time and concentration of sulphuric acid



Fig. 2. FTIR Spectrum Two

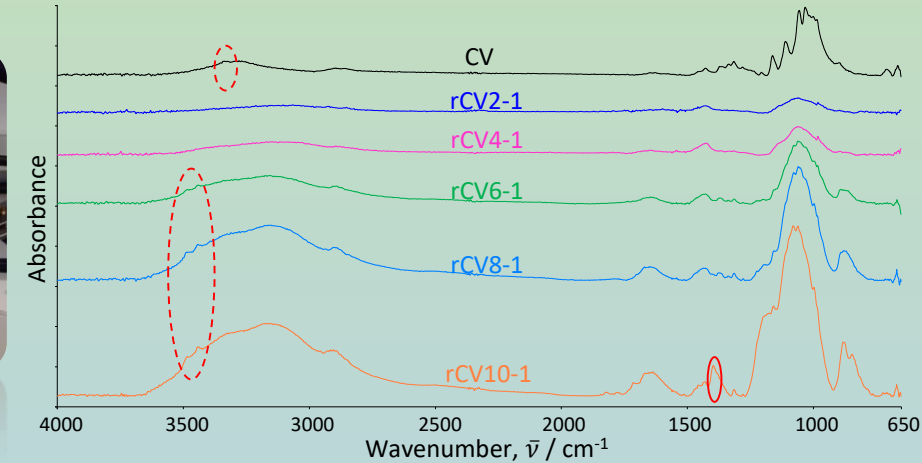


Figure 3. FTIR spectra of laboratory cotton wool and some samples of its regenerated cellulose fibers

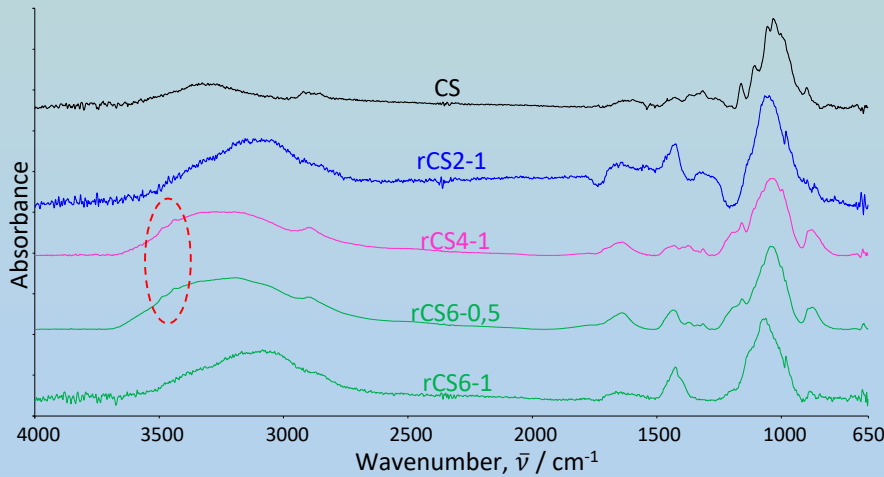


Fig. 4. FTIR spectra of laboratory cotton paper and selected samples of its regenerated cellulose fibers

Tab. 1. Wavenumbers of the maximum vibrational bands for cotton wool and some samples of its regenerated cellulose fibers

Vib./Sample	CV	rCV2-1	rCV4-1	rCV6-1	rCV8-1	rCV10-1
OH stretching /cm ⁻¹	3339	3090	3117	3485	3487	3485
	3297*			3440	3443	3443
				3323	3311	3311
CH stretching /cm ⁻¹	2895	2898	2895	2906*	2904	2905
				2892		
HCH/OCH bending in plane /cm ⁻¹	1426	1432	1436	1436	1436	1434
		1426*	1428*	1427*	1428*	1428*
COC/CO/CCH stretching /cm ⁻¹	896	894	895	889	887	880

Tab. 2. Crystallinity index of laboratory cotton wool and some samples of its regenerated cellulose fibers

Sample	CV	rCV2-1	rCV4-1	rCV6-1	rCV8-1	rCV10-1
A ₋₁₄₃₀	0,1174	0,4386	0,4150	0,2069	0,1650	0,2230
A ₋₉₀₀	0,1961	0,1178	0,1342	0,2770	0,2944	0,4213
CI	0,5987	3,7233	3,0923	0,7469	0,5619	0,5293

Tab. 3. Crystallinity index of laboratory paper and some samples of its regenerated cellulose fibers

Sample	CS	rCS2-1	rCS4-1	rCS6-0,5	rCS6-1
A ₋₁₄₃₀	0,8743	4,3854	2,2365	2,5564	4,3579
A ₋₉₀₀	2,0004	0,2687	3,9511	2,7504	0,8876
CI	0,4371	16,3208	0,5604	0,9295	4,9098

FTIR analysis confirmed successful regeneration from both waste cellulosic materials and its dependence on the regeneration time and the concentration of sulphuric acid. The optimal conditions for cellulose regeneration from the cotton wool is 8 min in 1 M sulphuric acid, while from the cotton paper is 4 min in 1 M sulphuric acid.