

# Select cellulose nanowhisker preparation techniques

Cellulose Source	Acid	Acid Concentration, wt %	Ratio of Cellulose to Acid,	Time of Hydrolysis Reaction, min	Temperature of Reaction Mixture, °C	CNW Dimensions (length x width), nm
Whatman No. 1 Filter Paper, < 20 mesh ground	H <sub>2</sub> SO <sub>4</sub>	64%	20 g/ 175 ml	60	45	115 x 7
Tunicate	H <sub>2</sub> SO <sub>4</sub>	55%	1g/100 ml	20	60	2000 x 10-20
Tunicin, <i>Halocynthia roretzi</i>	HCl	2.5 N	5g/100 ml	45		2000 x 10-20
Wheat Straw Cellulose	H <sub>2</sub> SO <sub>4</sub>	65%	5 wt%	60	25	150-300 x 5
Tunicin, <i>Halocynthia roretzi</i>	H <sub>2</sub> SO <sub>4</sub>	48%		13 h	55	1560 x 34
Cottonseed Linter Pulp	H <sub>2</sub> SO <sub>4</sub>	64%	30 g/ 250 ml	120	60	70-150 x 10-20
Bleached Softwood Kraft Pulp	H <sub>2</sub> SO <sub>4</sub>	65%	10 g / 100 ml	10	70	180 ± 75 x 3.5
Bleached Softwood Kraft Pulp	HCl	4 N	5 g/ 175 ml	225	80	180 ± 75 x 3.5 nm

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Microcrystalline Cellulose, MCC,	H <sub>2</sub> SO <sub>4</sub>	63.5%	10.2 g / 100ml	130	45	200-400 x <10
Black Spruce Sulfite Fully Bleached Pulp, <20 mesh screened	H <sub>2</sub> SO <sub>4</sub>	64%	8.75 g/ml	25	45	141 ± 6 x 5.0 ± 0.3
Eucalyptus Pulp, <20 mesh screened	H <sub>2</sub> SO <sub>4</sub>	64%	8.75 g/ml	25	45	147 ± 7 x 4.8 ± 0.4
Black Spruce Sulfite Fully Bleached Pulp, <20 mesh screened	H <sub>2</sub> SO <sub>4</sub>	64%	8.75 g/ml	45	45	120 ± 5 x 4.9 ± 0.3
Black Spruce Sulfite Fully Bleached Pulp, <20 mesh screened	H <sub>2</sub> SO <sub>4</sub>	64%	17.5 g/ml	45	45	105 ± 4 x 4.5 ± 0.3

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