Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Plasma surface-modification of cellulose nanocrystals: A green Alternative towards mechanical reinforcements of ABS

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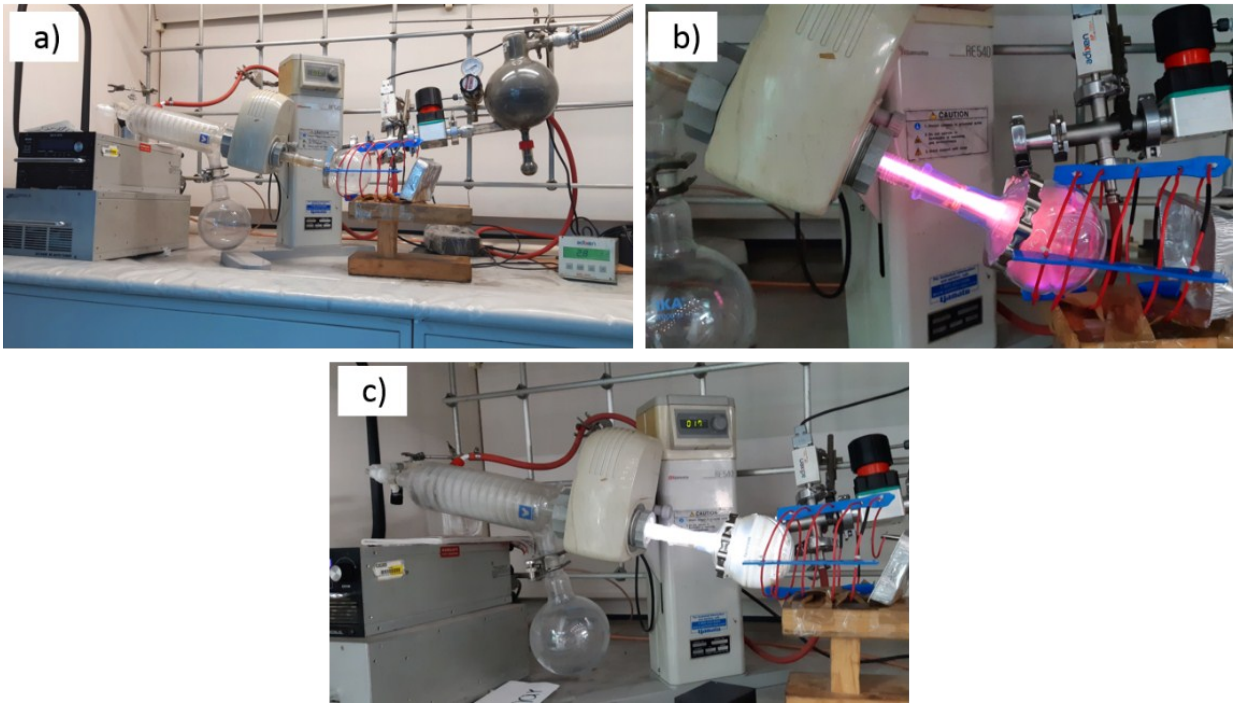


Figure S1. Photograph of the plasma reactor employed for the modification of the nanocrystals. A) Reactor before modification, B) Reaction test using an empty flask and air, C) Modification of CNC´s using Caprolactone.

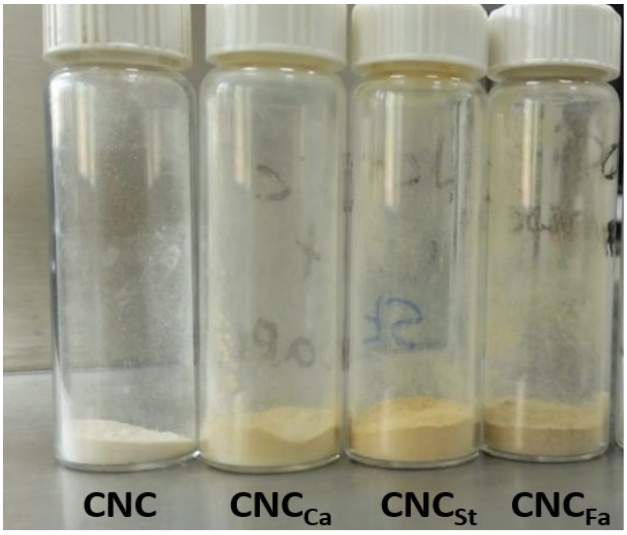


Figure S2. Photograph of cellulose nanocrystals before and after modification

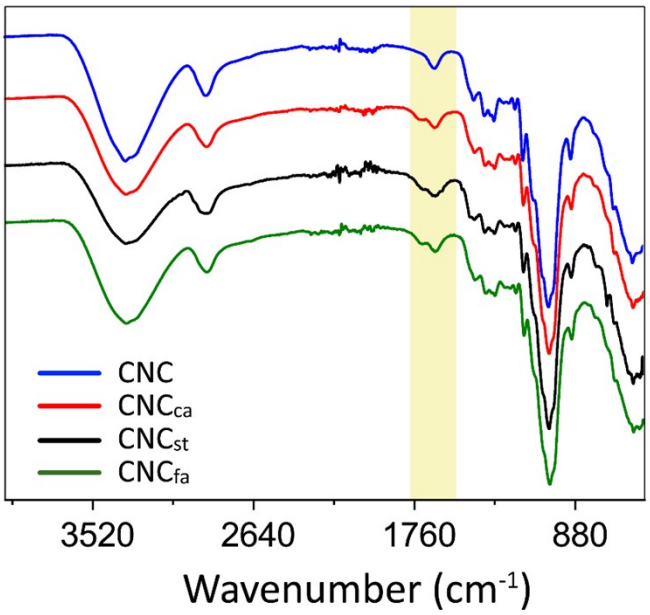


Figure S3. FTIR spectra of cellulose nanocrystals before and after plasma modification

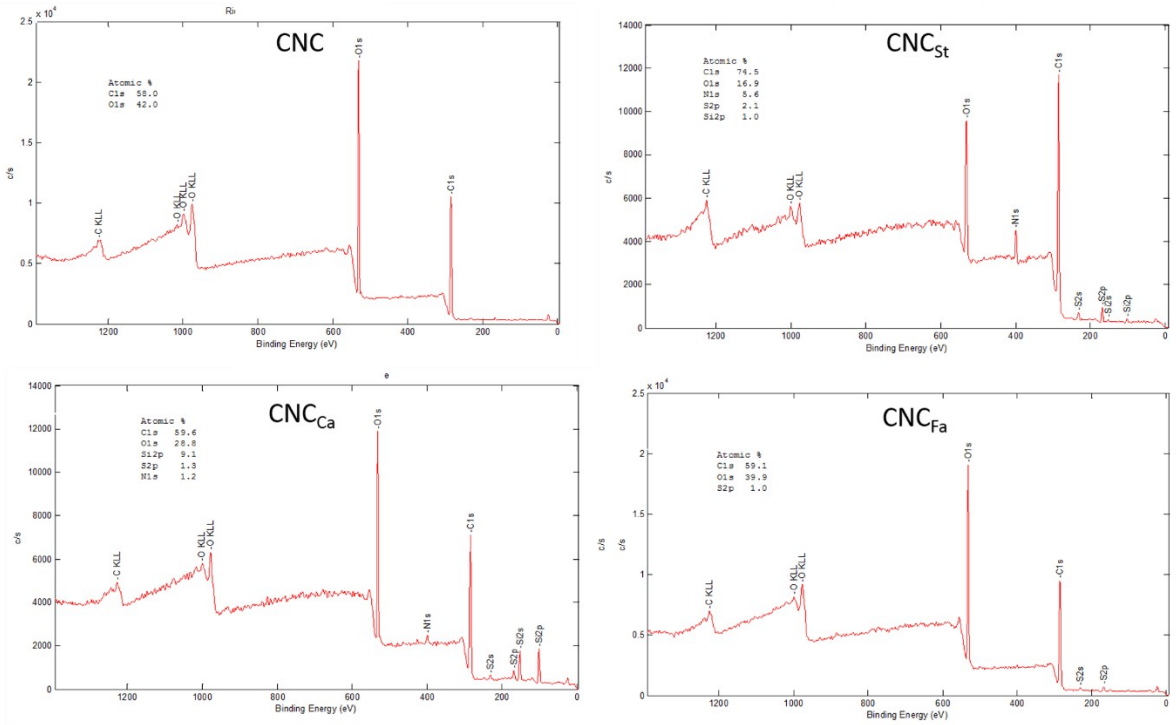


Figure S5. XPS survey of cellulose nanocrystals before and after modification

Table S1. Atomic composition of nanocrystals calculated from XPS

	Atomic ratio (%)		
Sample	**% C**	**% O**	**C/O**
CNC	58.0	42.0	1.38
CNC_{St}	74.5	16.9	4.40
CNC_{Ca}	59.6	28.8	2.06
CNC_{Fa}	82.6	14.9	5.54

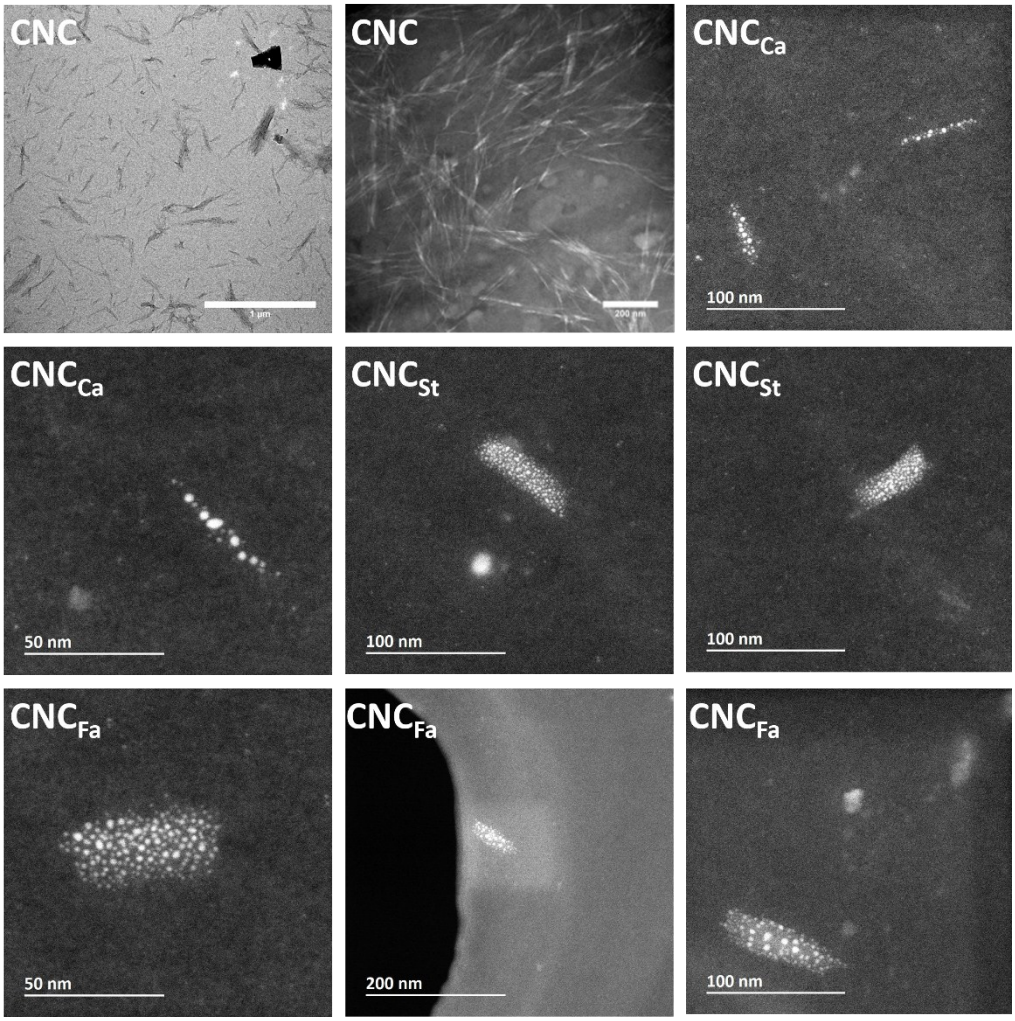
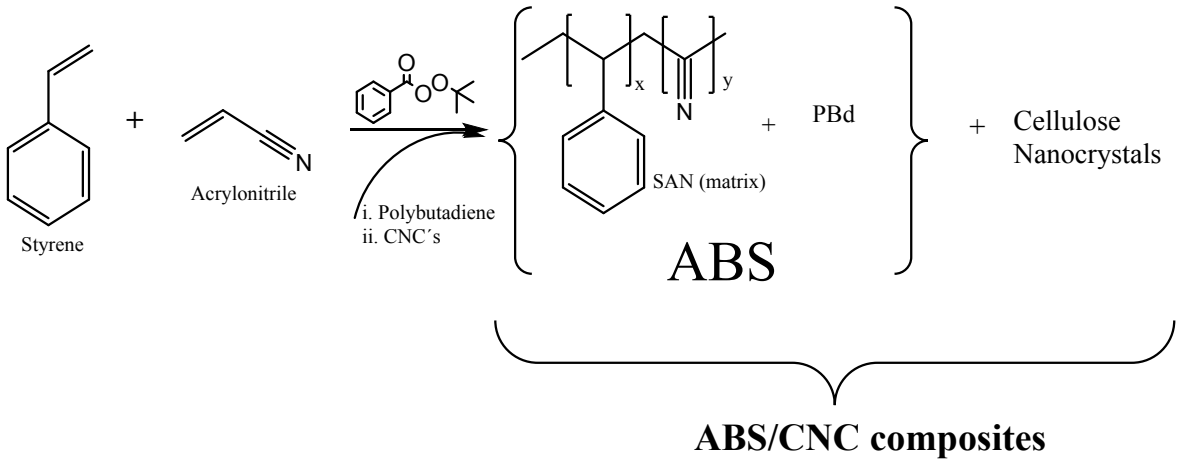


Figure S4. STEM micrographs of the cellulose nanocrystals before and after plasma modification



Scheme S1. Reaction diagram for the synthesis of ABS/CNC composites

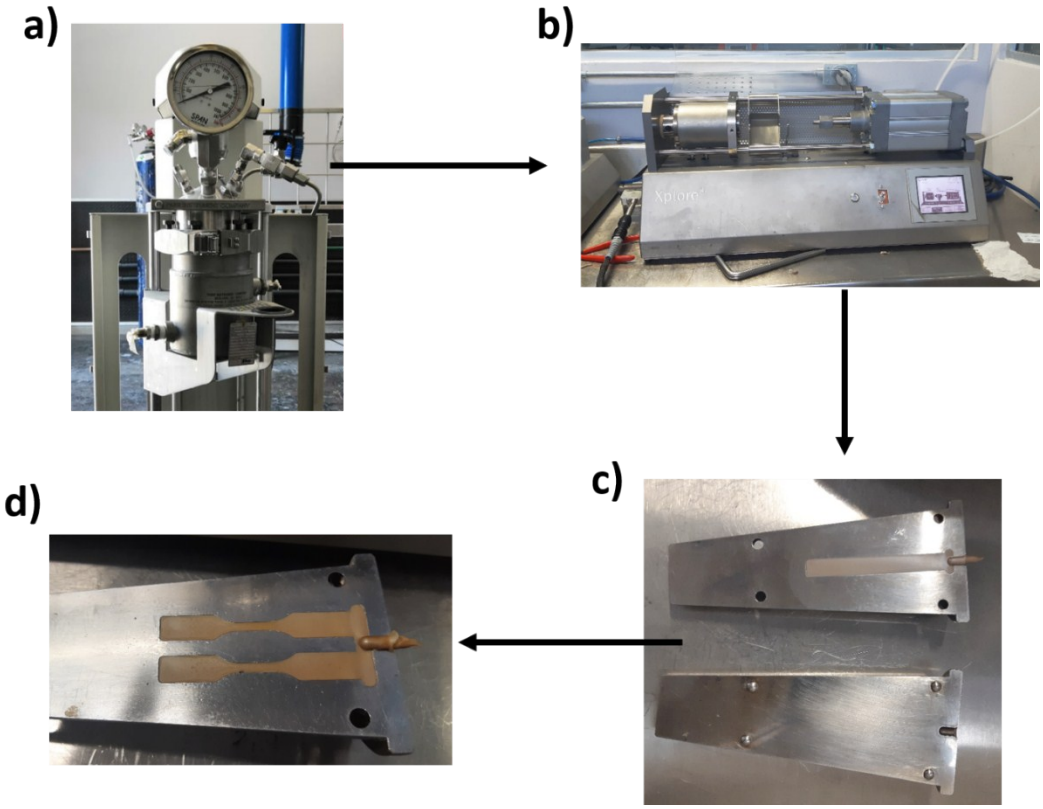


Figure S6. Schematic diagram of production of ABS/Nanocomposites: a) Stainless steel reactor (1 L capacity), equipped with an anchor-turbine stirrer used for the polymerization of ABS Nanocomposites; b) Xplore micro-injection moulder; c) Moulded sample of ABS/CNC; d) Moulded sample of ABS/CNC-g-Ca

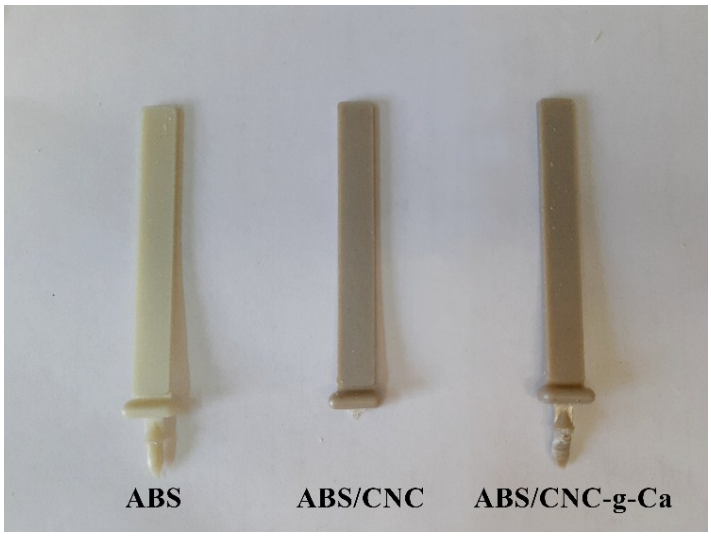


Figure S7. Injecton molded ABS samples with and without loading of cellulose nanocrystals

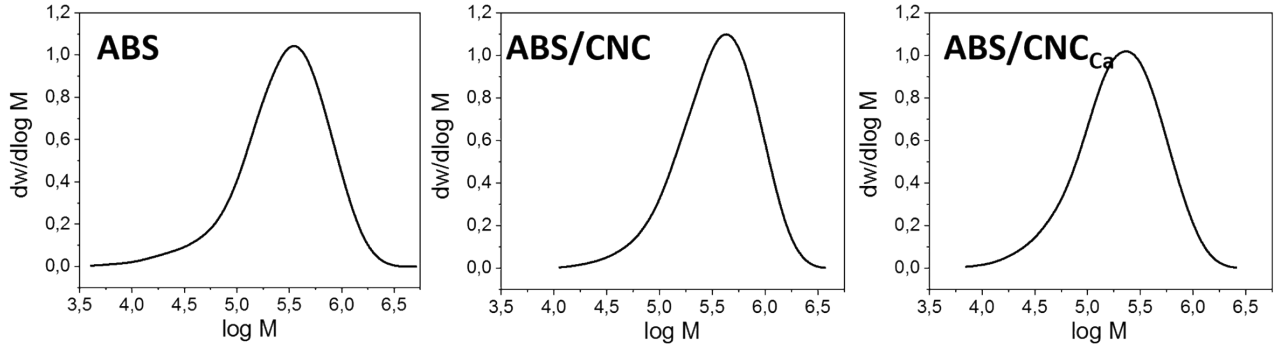


Figure S8. Size distribution of the different SAN copolymers in the synthesis of ABS/CNC nanocomposites

Table S2. Molecular weight characteristics of the SAN copolymers in the synthesis of ABS/CNC nanocomposites

Sample	Mp ($gmol^{-1}$) 10^{-4}	Mn ($gmol^{-1}$) 10^{-4}	Mw ($gmol^{-1}$) 10^{-4}	Mz ($gmol^{-1}$) 10^{-4}	PD
ABS	34.61	15.16	41.31	73.99	2.72
ABS/CNC	43.07	22.46	48.39	81.12	2.15
ABS/CNC$_{Ca}$	23.18	12.60	29.27	53.35	2.32