

Hybrid materials based on collagen-chitosan matrices modified by conjugate of silver nanoparticles with quercetin

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Powder X-ray diffraction (PXRD) was performed on a D8 Advance diffractometer (Bruker AXS, Germany) in the Bragg–Brentano focusing geometry (CuK α -radiation, angle range was 5°-100°, pitch was 0.02°, scanning speed was 0.5–2 degrees/min). The samples were placed on flat holders. The diffractogram profiles were analyzed using the TOPAS 5 software package (Bruker AXS).

Table 1. Characteristics of the C 1s and O 1s photoelectron spectra of quercetin.

C 1s		C-C/C-H	C-O-C	C-OH	C=O	Sat1	Sat2	Sat3
	E _b , eV	284.8	285.8	286.8	287.4	289.3	290.8	292.3
	W, eV	1.05	1.10	1.03	1.10	1.20	1.30	1.25
	I _{rel}	0.4	0.13	0.35	0.07	0.02	0.02	0.01
O 1s		C=O	C-OH	C-O-C				
	E _b , eV	532.1	533.3	534.1				
	W, eV	1.11	1.12	1.13				
	I _{rel}	0.14	0.72	0.14				

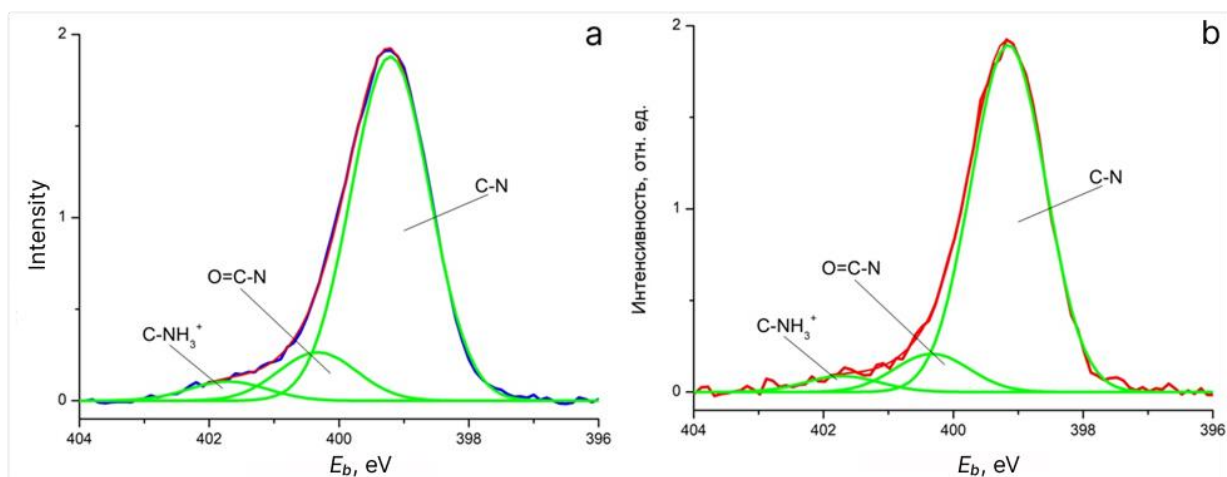


Fig. 1. The N 1s photoelectron spectra of Chit (a) and ChitAgNPs@Q(b).

Table 2. Characteristics of the N 1s photoelectron spectra of Chit and ChitAgNPs@Q.

Образец		C-N	O=C-N	C-NH ₃ ⁺
Chit	E _b , eV	399.2	400.3	401.7
	W, eV	1.21	1.21	1.21
	I _{rel}	0.84	0.12	0.05
ChitAgNPs@Q	E _b , eV	399.2	400.4	401.7
	W, eV	1.15	1.15	1.15
	I _{rel}	0.86	0.1	0.04

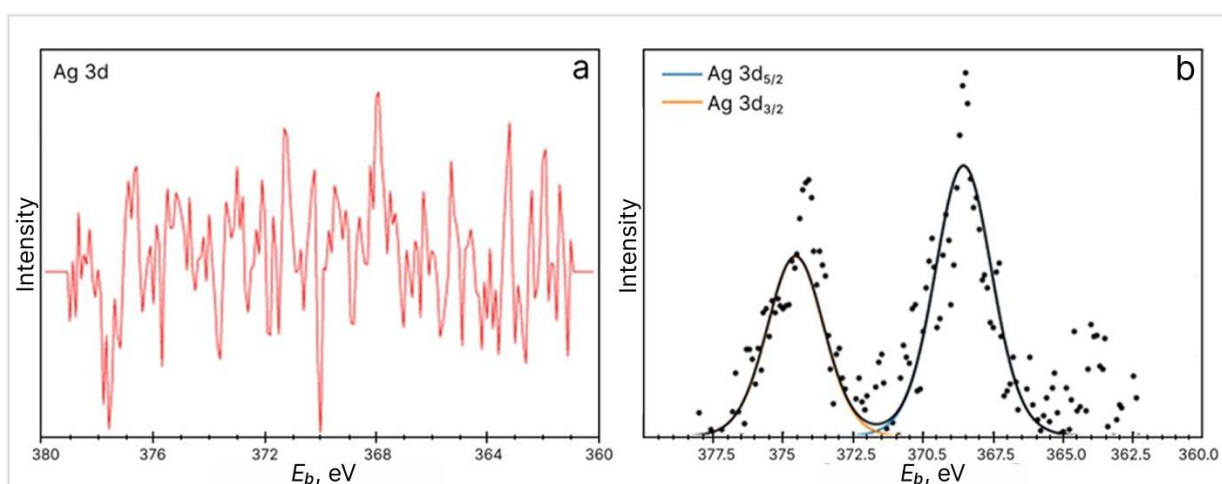


Fig. 2. The Ag 3d spectra of the ColChitAgNPs composite before (a) and after treatment with argon ions (b).

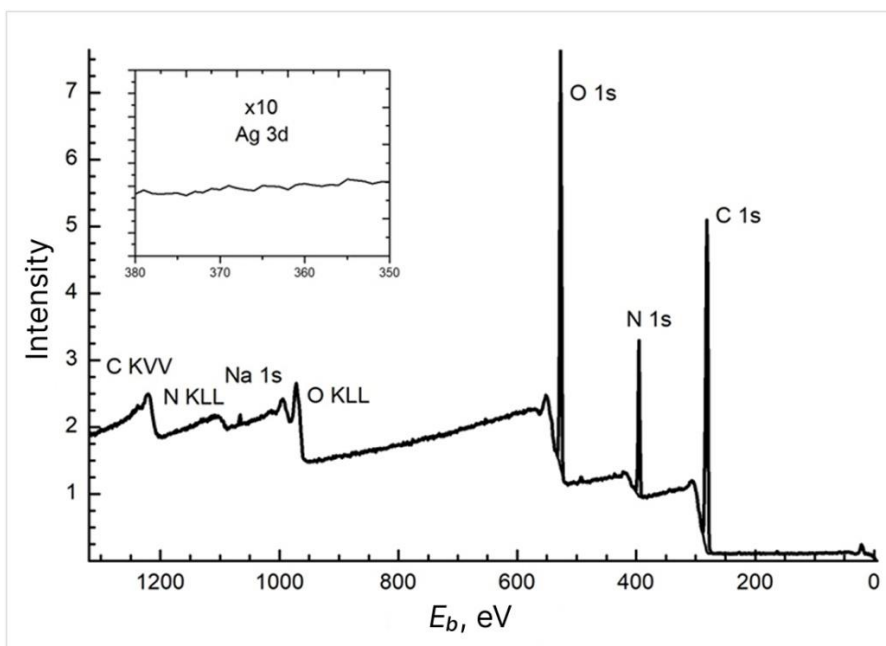


Fig. 3. Survey spectrum of ColChitAgNPs@Q.

Table 3. Concentrations of elements on the surface of the ColChitAgNPs@Q sample calculated from the XPS spectra.

	C 1s	O 1s	N 1s	Ag 3d	Na 1s	S 2p
C (at. %)	63.9	22.9	13.3	-	0.2	0.1

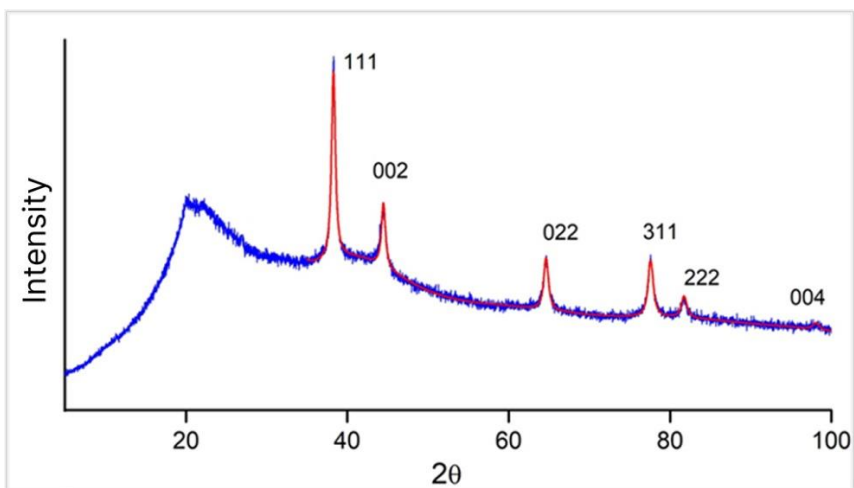


Fig. 4. Experimental (blue) and calculated (red) ColChitAgNPs diffractograms. The figures indicate the reflection indices of the Ag phase.

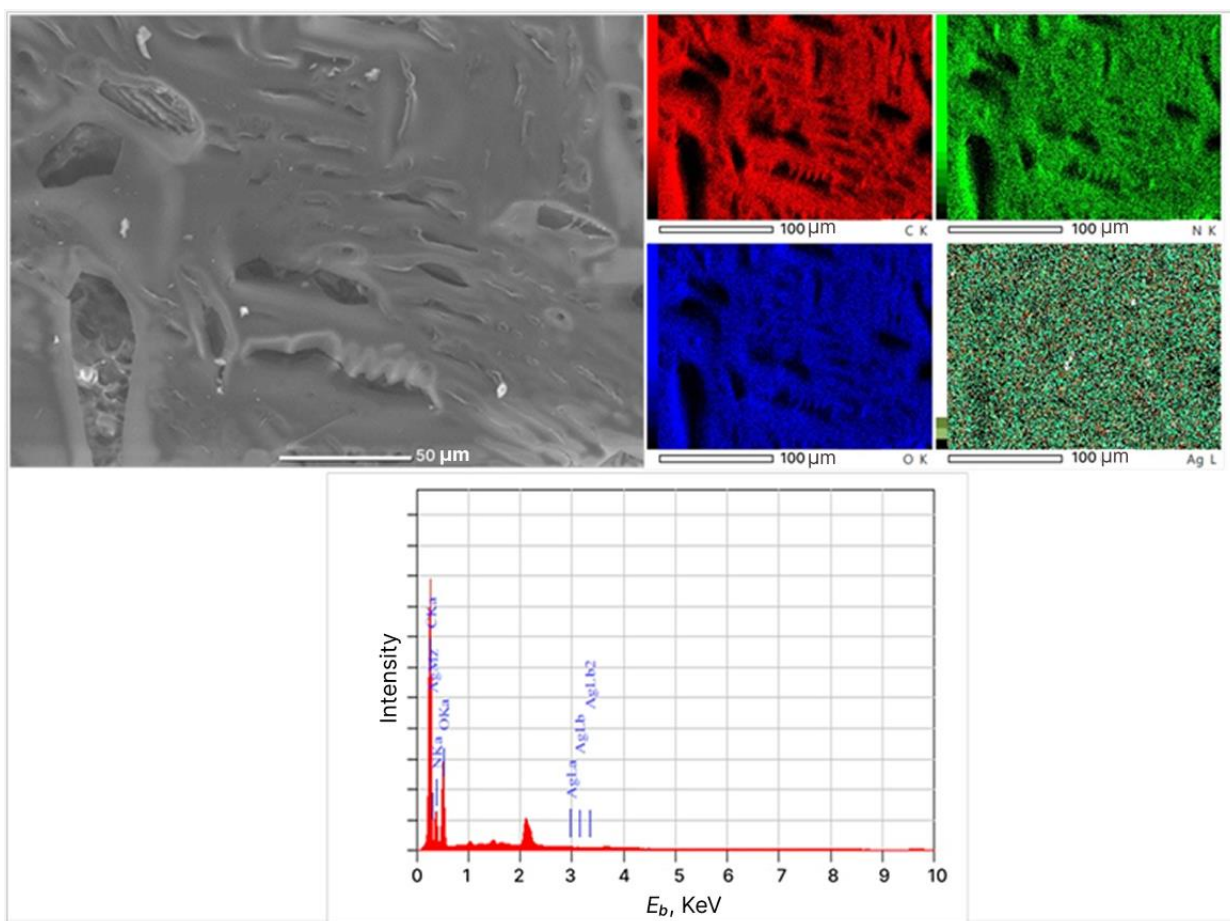


Fig. 5. SEM image of morphology, elemental maps, and the energy dispersion spectrum of ColChitAgNPs.