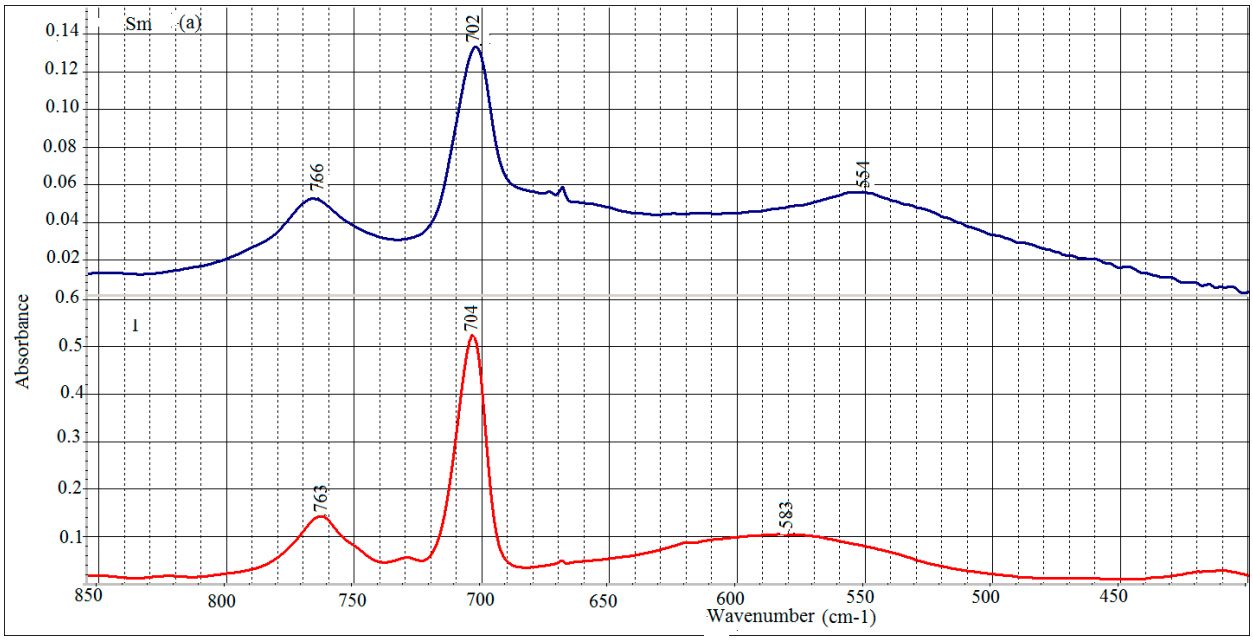
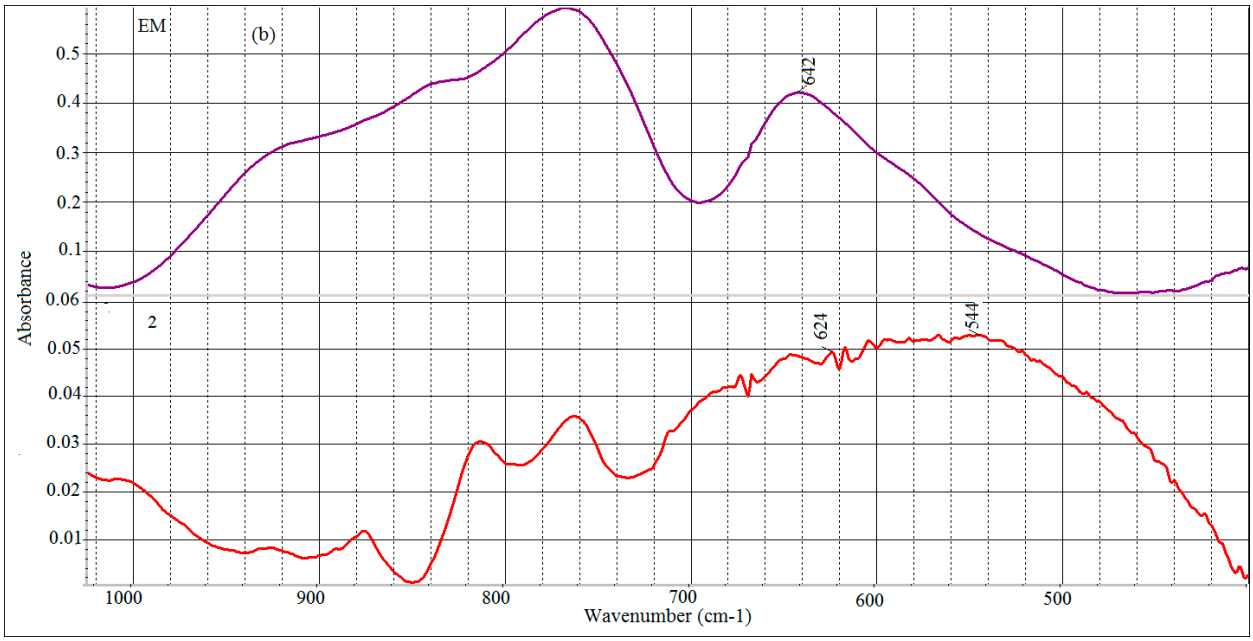
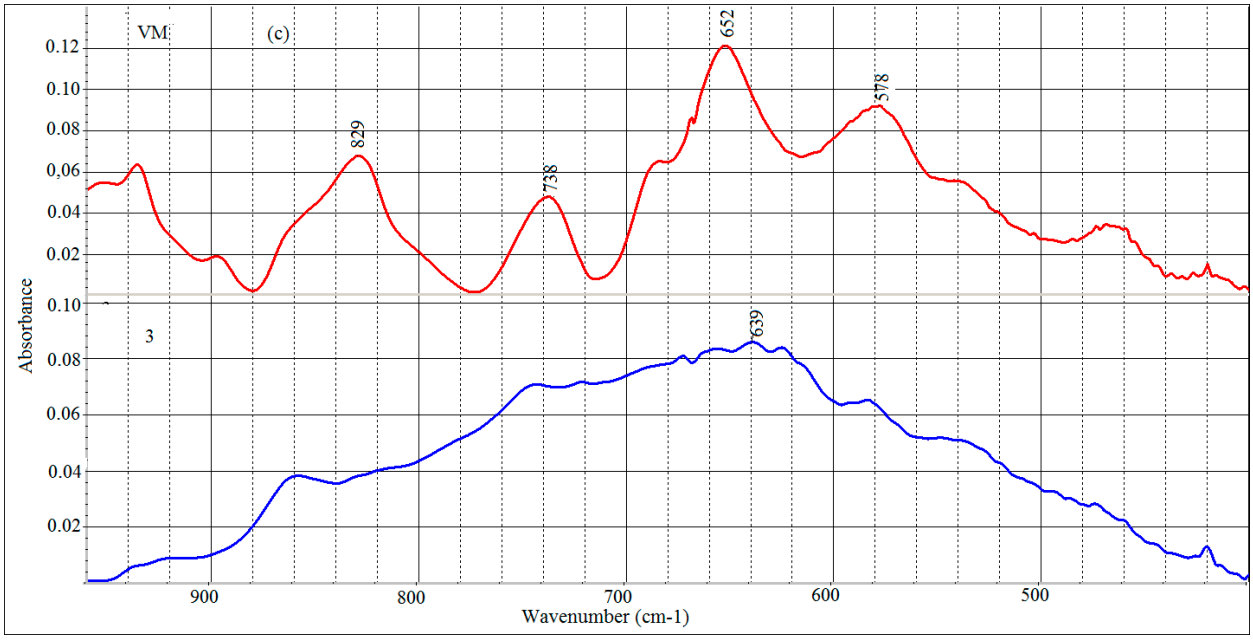
Supplementary Materials

Figure S1 (a-c): FTIR spectra of initial copolymers and heterodimers.

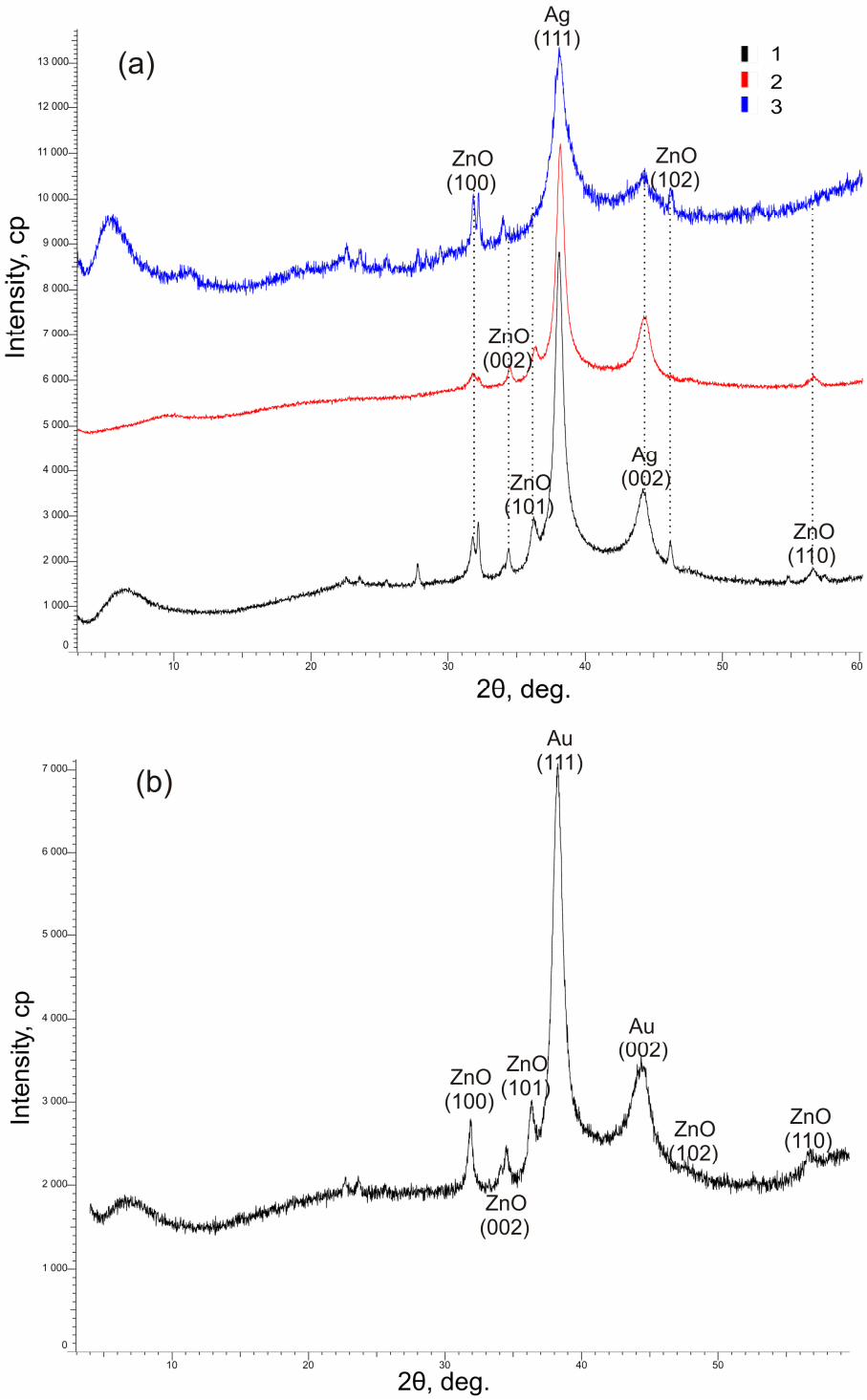






Samples: SM, EM and VM - initial copolymers; 1- SM/Ag^0/ZnO, 2- EM/Ag^0/ZnO, 3- VM/Ag^0/ZnO; Bonds 768, 763, 738, 704, 652, 642 cm^{-1} - deformation vibrations of various C-H bonds; bonds 625, 624, 551, 544 cm^{-1} - stretching vibrations of Zn–O and Ag–ZnO bonds [88, 90-93].

Figure S2 (a, b): XRD patterns of heterodimers: (a) VM/Ag^0/ZnO (1), EM/Ag^0/ZnO (2), SM/Ag^0/ZnO (3), (b)VM/Au^0/ZnO.



The peaks corresponding to Ag crystal phase are at ~38.1 and 44.2° and to Au crystal phase are at ~38.2 and 44.3° and ZnO (zincite) are at ~31.8, 34.4, 36.1, 47.5, and 56.7. Their positions correspond to Miller indexes: 111 and 002 for Ag(Au), and 100, 002, 101, 102 and 110 for ZnO. [Suh, I.-K., Ohta, H., Waseda, Y. High-Temperature Thermal Expansion of Six Metallic Elements Measured by Dilatation Method and X-Ray Diffraction. J. Mater. Sci. **1988**, 23, 757-780. https://doi.org/10.1007/BF01174717]. The mean crystallite sizes of the nanoparticles were

calculated from the broadening of the peaks using the Scherrer formula [Patterson, A.L. The Scherrer Formula for X-Ray Particle Size Determination. Phys. Rev. **1939**, 56, 978. 826 https://doi.org/10.1103/PhysRev.56.978].

Table S1: Characteristics of the Au 4f, Zn 2p and Zn 3p photoelectron spectra: binding energies (E_b), Gaussian widths (W), and relative intensities (I_{rel}) of photoelectron peaks belonging to different chemical groups in the C 1s and N 1s spectra.

Sample		Au				Zn						sat	Δ		
		$4f_{7/2}$	$4f_{5/2}$	$4f_{7/2}$	$4f_{5/2}$	$2p_{3/2}$	$2p_{3/2}$	$2p_{3/2}$	$3p_{1/2}$	$3p_{3/2}$	$3p_{1/2}$		Δ_1	Δ_2	Δ_3
VM/Au^0/ZnO	E_b, eV	83.9	87.6	84.8	88.5	1022.2	1024.2	89.7	92.7	90.6	93.4	86.5	932.5	938.2	5.8
	W, eV	1.0	0.96	1.05	1.03	1.44	1.44	2.05	1.94	2.1	2.2	5.0			
	I_{rel}	0.46	0.33	0.12	0.09	0.94	0.06	0.52	0.26	0.15	0.08				
VM/Ag^0/ZnO	E_b, eV					1022.2	1023.8	89.4	92.2			86.4	932.8		
	W, eV					1.44	1.44	2.01	2.39			3.75			
	I_{rel}					0.94	0.06	0.67	0.33						

Δ_1 = Zn $2p_{3/2}$ - Zn $3p_{3/2}$; Δ_2 = Zn $2p_{3/2}$ – Au $4f_{7/2}$; Δ_3 = Zn $3p_{3/2}$ – Au $4f_{7/2}$

Figure S3. The O 1s, C 1s and N 1s of Ag^0/ZnO (1) and Au^0/ZnO (2) structures stabilized with VM.

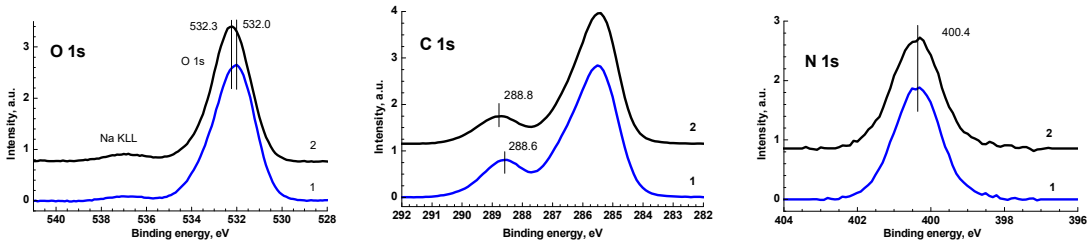


Figure S3 shows the O 1s, C 1s and N 1s of Ag^0/ZnO (1) and Au^0/ZnO (2) structures stabilized with VM. The binding energies of the main peaks in the O 1s spectra differ by 0.3 eV. This deference resulted from the difference in the interaction of Ag and Au atoms with C(O)O group, which in turn is reflected in the C 1s spectra, where the corresponding binding energies assigned to C(O)O group differ by 0.2 eV. The N 1s spectra appear similar.