polymers

MDPI

In Situ Synthesis of AZO-Np in Guar Gum/PVOH Composite Fiber Mats for Potential Bactericidal Release

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Table S1. Samples accordingly to their percentage weight (w/w)%.

Sample	PVOH (g)	GG (g)	CA (g)	AZO-Np (g)	Percentage weight (w/w)%
Control	1.05	0.42	0.15	-	(5/2/0.7)
1	1.05	0.42	0.15	0.054	(5/2/0.7/0.25)
2	1.05	0.42	0.15	0.108	(5/2/0.7/0.5)
3	1.05	0.42	0.15	0.216	(5 /2/0.7/1)
4	1.05	0.42	0.15	0.432	(5/2/ 0.7/2)
5	1.10	0.46	0.15	0.670	(5/2/0.6/3)

Table S2. Measured interplanar spacing d_{hkl} from Figure 2F and known d_{hkl} from literature*.

Measured d_{hkl} (Å)	d_{hkl} from literature (Å)
2.81±0.02	2.8143 ZnO (100)
2.58±0.02	2.6033 ZnO (002)
1.92±0.02	1.9111 ZnO (102)
1.62±0.02	1.6247 ZnO (110)

*PDF number: 000-36-1451(Crystallographica Search-Match Program).

Table S3. Rheological parameters corresponding to the Oswald de Waele mathematical model.

Sample	*n*	*K* (Pa.s^n)	r^2
PVOH/GG	0.88	1.49	0.95
PVOH/GG/CA	0.93	1.49	0.95
PVOH/GG/CA/ 0.25 % AZO-Np	0.81	2.40	0.97
PVOH/GG/CA/ 0.5 % AZO-Np	0.82	2.30	0.98
PVOH/GG/CA/ 1 % AZO-Np	0.90	1.74	0.98
PVOH/GG/CA/ 2 % AZO-Np	0.91	1.47	0.97
PVOH/GG/CA/ 3 % AZO-Np	0.80	3.71	0.99

Oswald de Waele equation: $\tau = K \dot{\gamma}^{n}$.

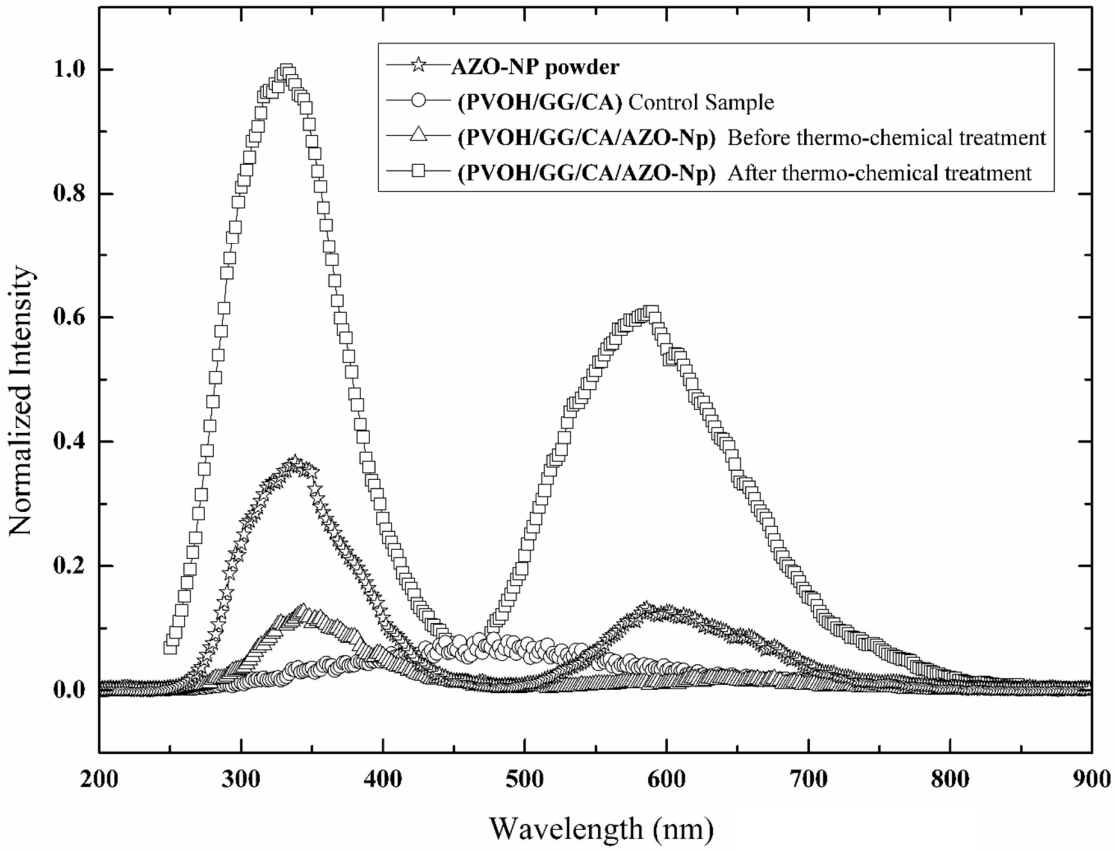

Figure S1. Normalized Cathodoluminescence from **AZO-Np** powder, Control membrane **(PVOH/GG/CA**), Membrane before thermo-chemical treatment **(PVOH/GG/CA/ AZO-Np)** and membrane after thermo-chemical treatment **(PVOH/GG/CA/ AZO-Np)**.

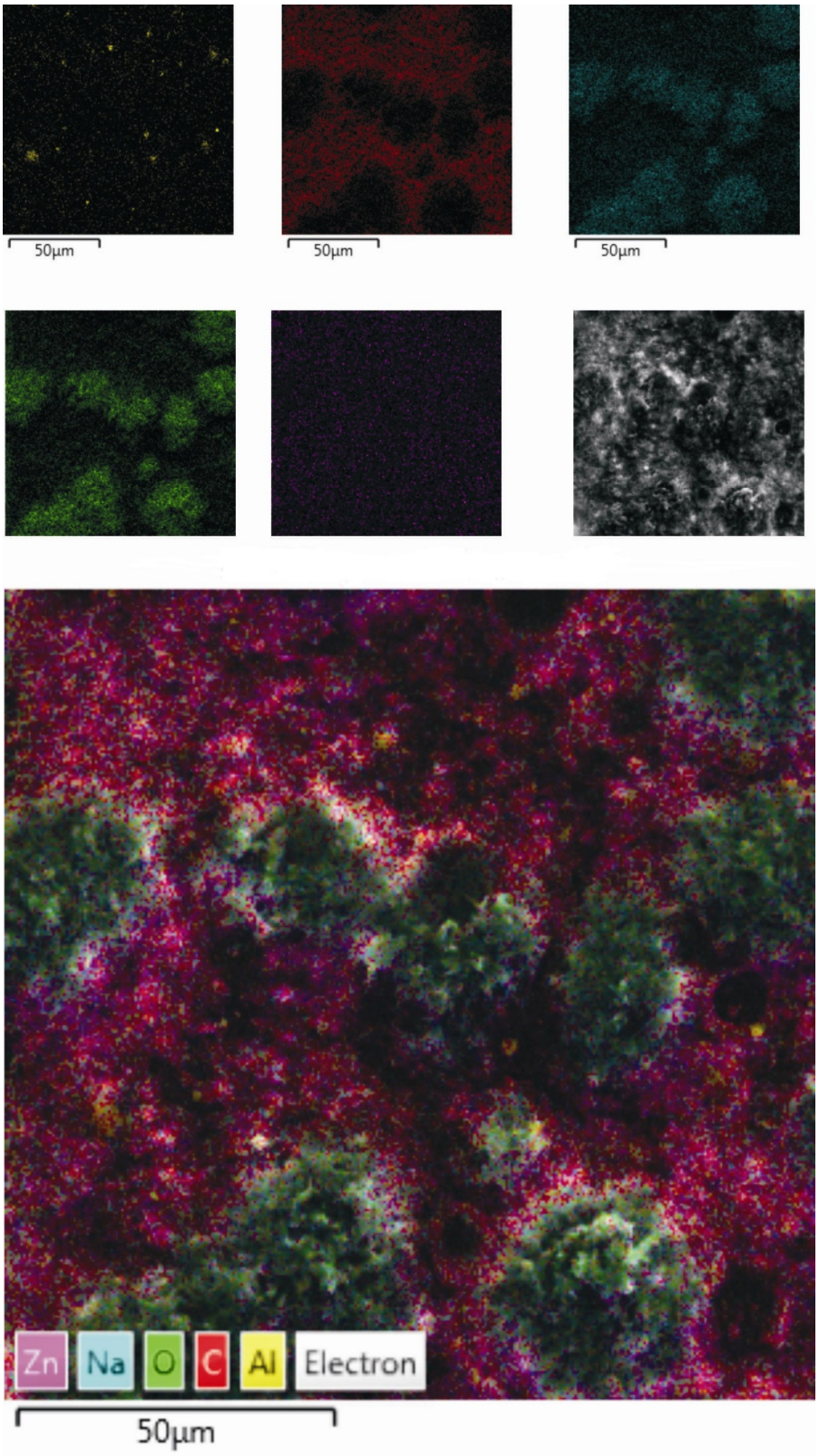

Figure S2. SEM image of sample (PVOH/GG/CA/AZO-Np) (4.8/1.9/2/0.5) (w/w) % thermo-chemically treated and EDS elemental map.

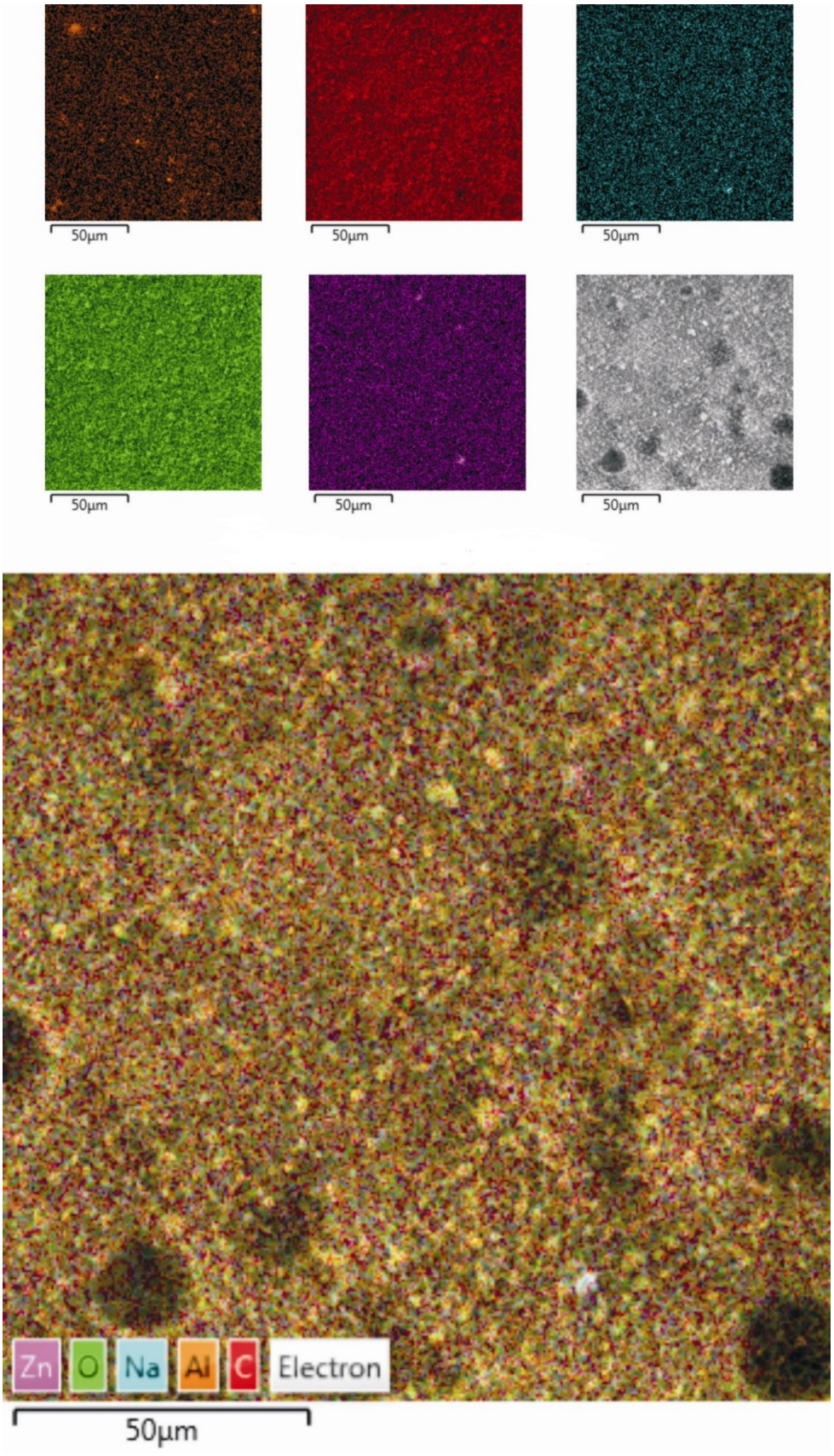
50μm
50μm
50μm
50μm
50μm
50μm
Zn
O
Na
Al
C
Electron
50μm

Figure S3. SEM image of sample (PVOH/GG/CA/AZO-Np) (4.8/1.9/2/0.5) (w/w) % before thermochemical treatment and EDS elemental map.

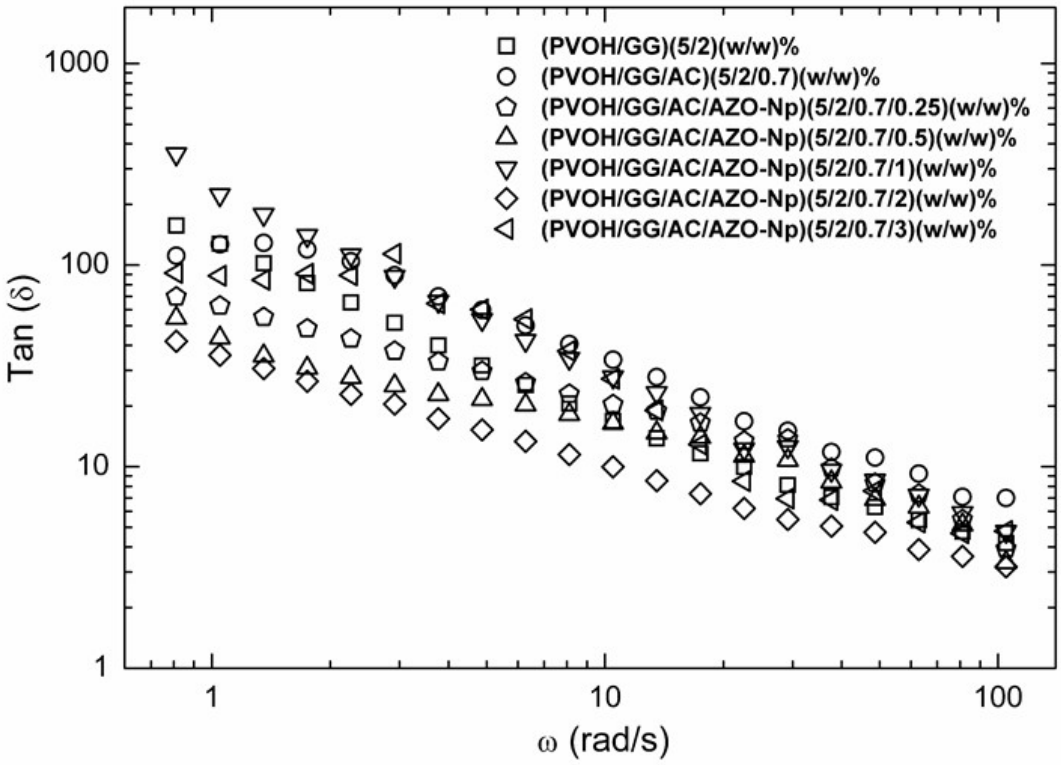

Figure S4. Tan (δ) values as a function of angular frequency for samples with AZO-Np in different concentrations and the controls PVA/GG and PVA/GG/CA.