

SUPPORTING INFORMATION

A novel polymer composite from polyhexamethylene guanidine hydrochloride for high performance triboelectric nanogenerators (TEGs)

Doan T. Tung^a, Le T. T. Tam^{a,b}, Nguyen T. T. Duong^{a,b}, Hoang T. Dung^{a,b}, Ngo T. Dung^a, Nguyen A. Duc^c, Phan N. Hong^d, Nguyen T. Dung^a, Phan N. Minh^{b*} and Le T. Lu^{a,b*}

^a. Institute for Tropical Technology, Vietnam Academy of Science and Technology, 18 Hoang Quoc Viet, Hanoi, Vietnam

^b. Graduate University of Science and Technology, Vietnam Academy of Science and Technology, 18 Hoang Quoc Viet, Hanoi, Vietnam

^c. Department of Physics, Faculty of Basic-Fundamental Sciences, Viet Nam Maritime University, 484 Lach Tray Road, Le Chan, Hai Phong, Viet Nam

^d. Center for high technology research and development, Vietnam Academy of Science and Technology, 18 Hoang Quoc Viet, Hanoi, Vietnam

*Corresponding authors: pnminh@vast.vn; ltlu@itt.vast.vn

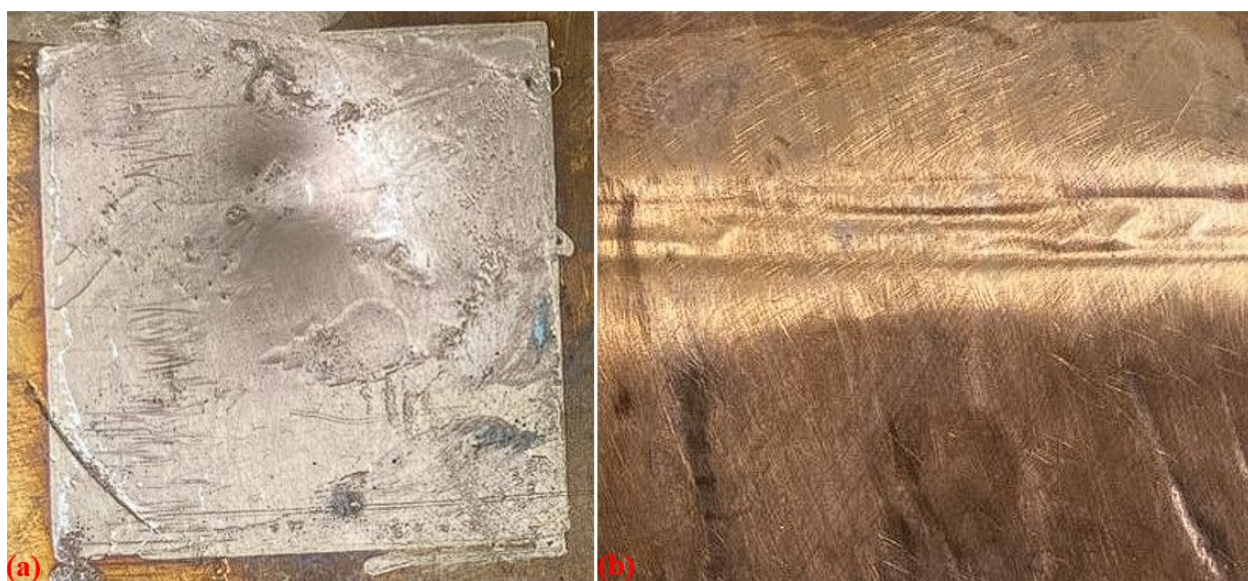


Fig. S1. PHMG8-GA-PVA1 film printed on copper foil after impact (a) and bending (b) strength test

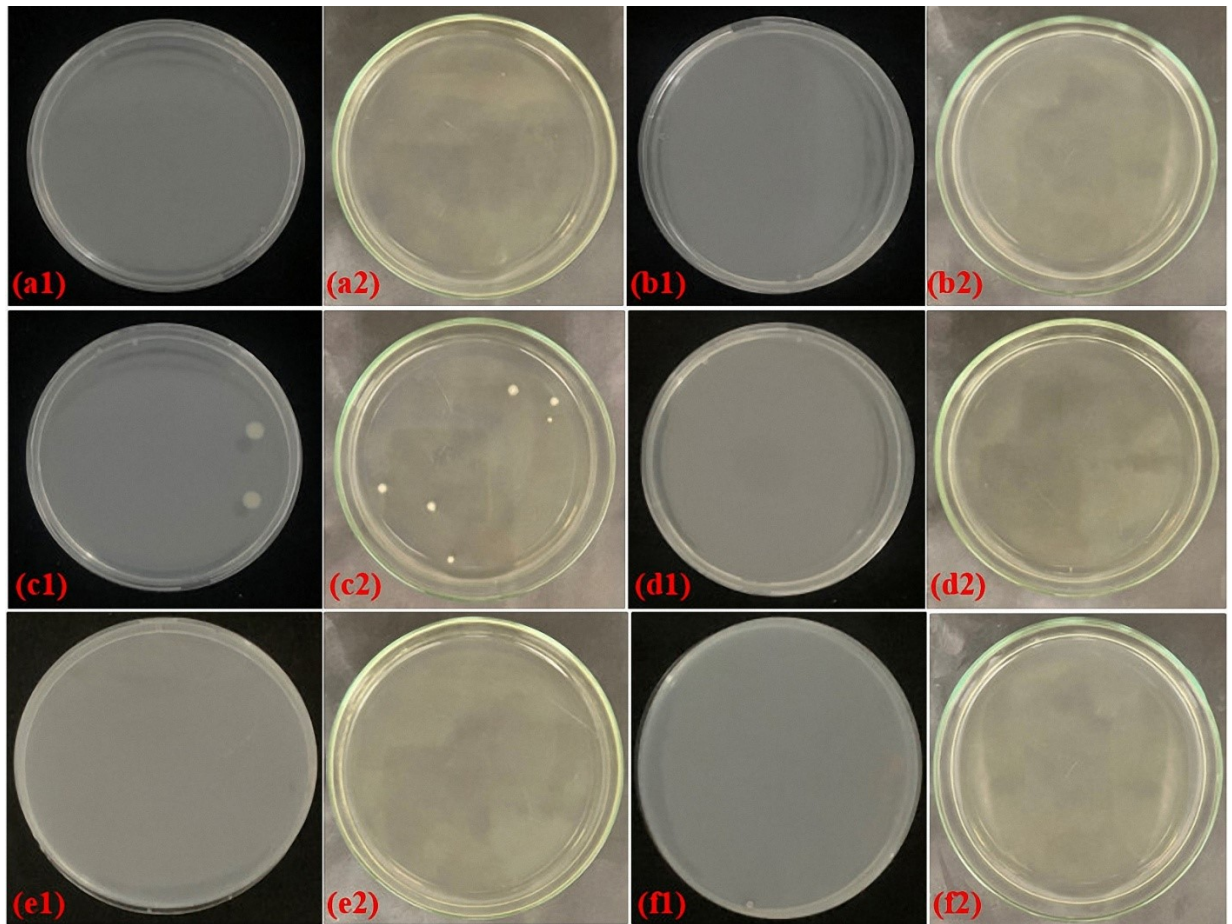


Fig. S2. Response of *S. subtilis* (1) and *E. coli* (2) bacteria of a) PHMG, b) PHMG-GA, c) PHMG soaked in water for 15 minutes, d) PHMG-GA soaked in water for 15 minutes, e) PHMG8-GA-PVA1, f) PHMG8-GA-PVA1 soaked in water for 15 minutes

Table S1. Comparison of some positive friction materials

No.	Triboposive material	Tribonegative material	Applied force (N)	Applied frequency (Hz)	Maximum output voltage (V)	Ref.
1	Cellulose nanofibrils (CNF)	FEP	-	10	32.8	[S1]
2	Chitosan	FEP	8	5	150	[S2]
3	Al	FEP	20	-	200	[S3]
4	TPU fiber (electrospinnig)	FEP (without MoS ₂)	-	~ 4	150	[S4]
5	Polyamide-66 (PA66)	FEP	10	2	153	[S5]
6	PVA	PTFE	50	5	511	[S6]

7	PVA	FEP	10	3 Hz	181	This work
8	PHMG8-GA-PVA1	FEP	10	1 Hz	467.4	This work

Reference

- [S1] C. Yao, A. Hernandez, Y. Yu, Z. Cai and X. Wang, *Nano Energy*, 2016, **30**, 103-108.
- [S2] J.-N. Kim, J. Lee, T. W. Go, A. Rajabi-Abhari, M. Mahato, J. Yo. Park, H. Lee and I.-K. Oh, *Nano Energy*, 2020, **75**, 104904.
- [S3] S. Wang, Y. Xie, S. Niu, L. Lin, C. Liu, Y. S. Zhou, and Z. L. Wang, *Adv. Mater.*, 2014, **26**, 6720-6728.
- [S4] D. K. Tran, S. Veeralingam and J.-W. Kim, *Nano Energy*, 2024, **127**, 109714.
- [S5] J. Liu, P. Ji, Z. Wang, X. Liu, Y. Lin, X. Li, L. Chen, Xi. Tianb and S. Luo, *J. Mater. Chem. C*, 2023, **11**, 12222-12233.
- [S6] L. Shi, S. Dong, H. Xu, S. Huang, Q. Ye, S. Liu, T. Wu, J. Chen, S. Zhang, S. Li, X. Wang, H. Jin, J. M. Kim, J. Luo, *Nano Energy*, 2019, **64**, 103960.