Supplementary Information (SI)

Interface-Engineered HMS/PANI Thermoelectric Device for 3D Printer Waste Heat Harvesting

Nishath Begum Jamal Mohammed[a], Rajasekar Parasuraman[a*], Pandiyarasan Veluswamy[c], Arunkumar Chandrasekhar[b*]

a.   *Department of Chemistry, School of Advanced Sciences, Vellore Institute of Technology (VIT), Vellore, Tamil Nadu 632 014, India*

b.   *Nanosensors and Nanoenergy (NSNE) Lab, Department of Sensors and Biomedical Technology, School of Electronics Engineering, Vellore Institute of Technology, Vellore, Tamil Nadu, India*

c.   *Smart and Innovative Laboratory for Energy Device Lab, Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram, Tamil Nadu 600127, India*

Corresponding author mail ID: arunkumar.c@vit.ac.in, rajasekar.mgac@gmail.com
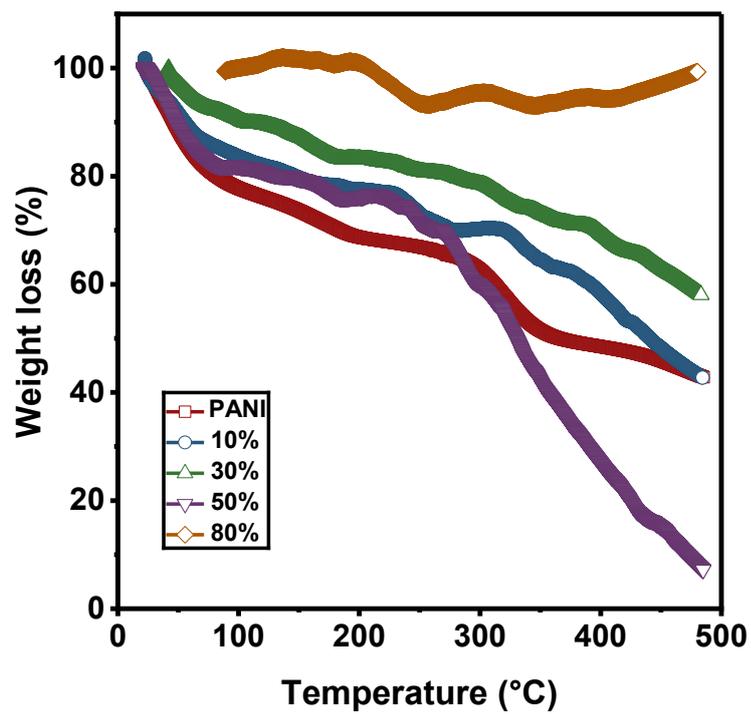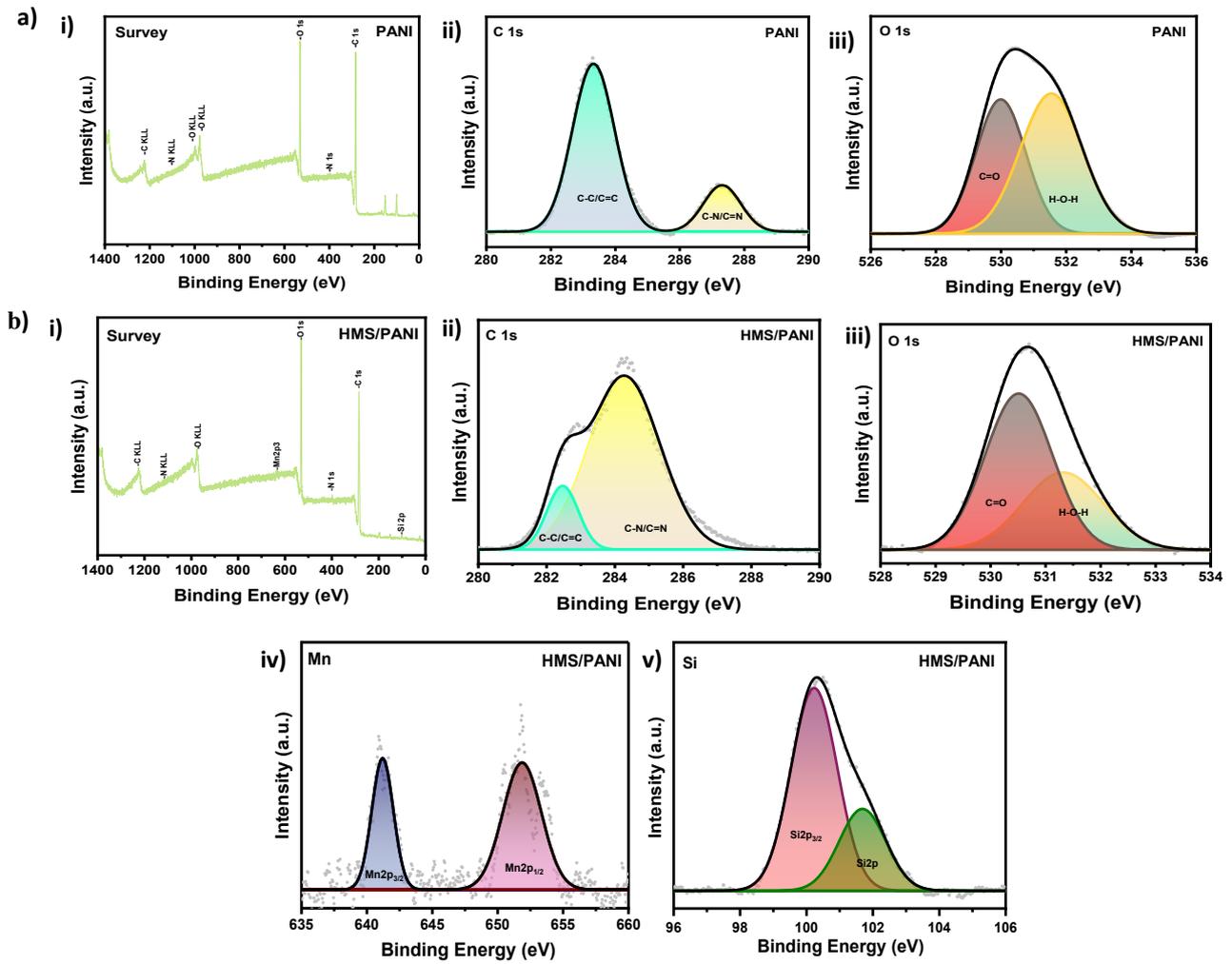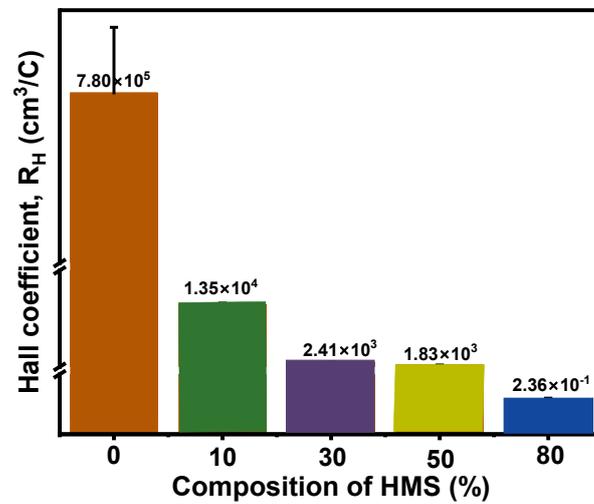
TGA analysis

Fig. S1. TGA analysis of HMS/PANI composites ranging from 0 to 80%.
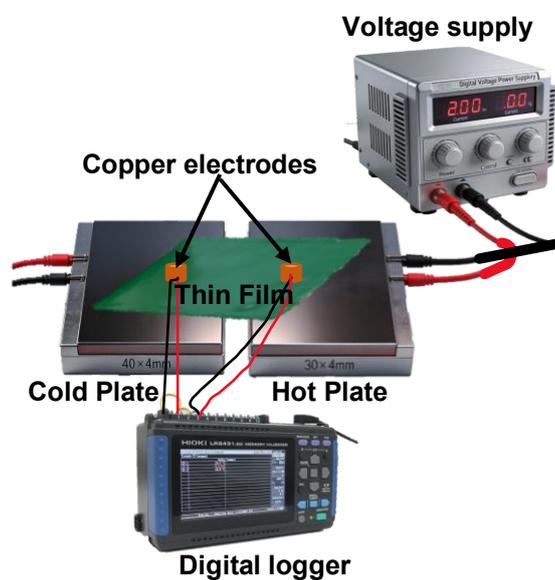
XPS analysis

Fig. S2. a) XPS analysis of PANI- I) Survey, II) C 1s, III) O 1s. b) XPS analysis of HMS/PANI (50%) - I) Survey, II) C 1s, III) O 1s, IV) Mn and V) Si.
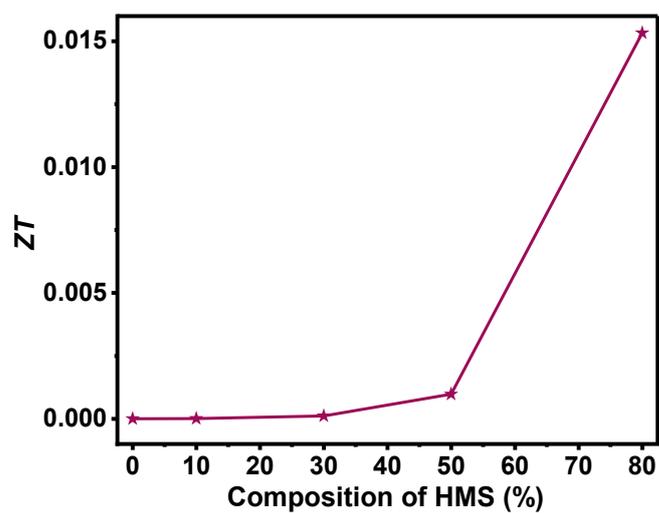
Hall coefficient measurement

Seebeck measurement setup

Fig. S4. Schematic representation of the home-build Seebeck coefficient measurement setup.

Calculated dimensionless figure of merit (*ZT*)

Fig. S5. Calculated *ZT* of HMS/PANI composite thin films
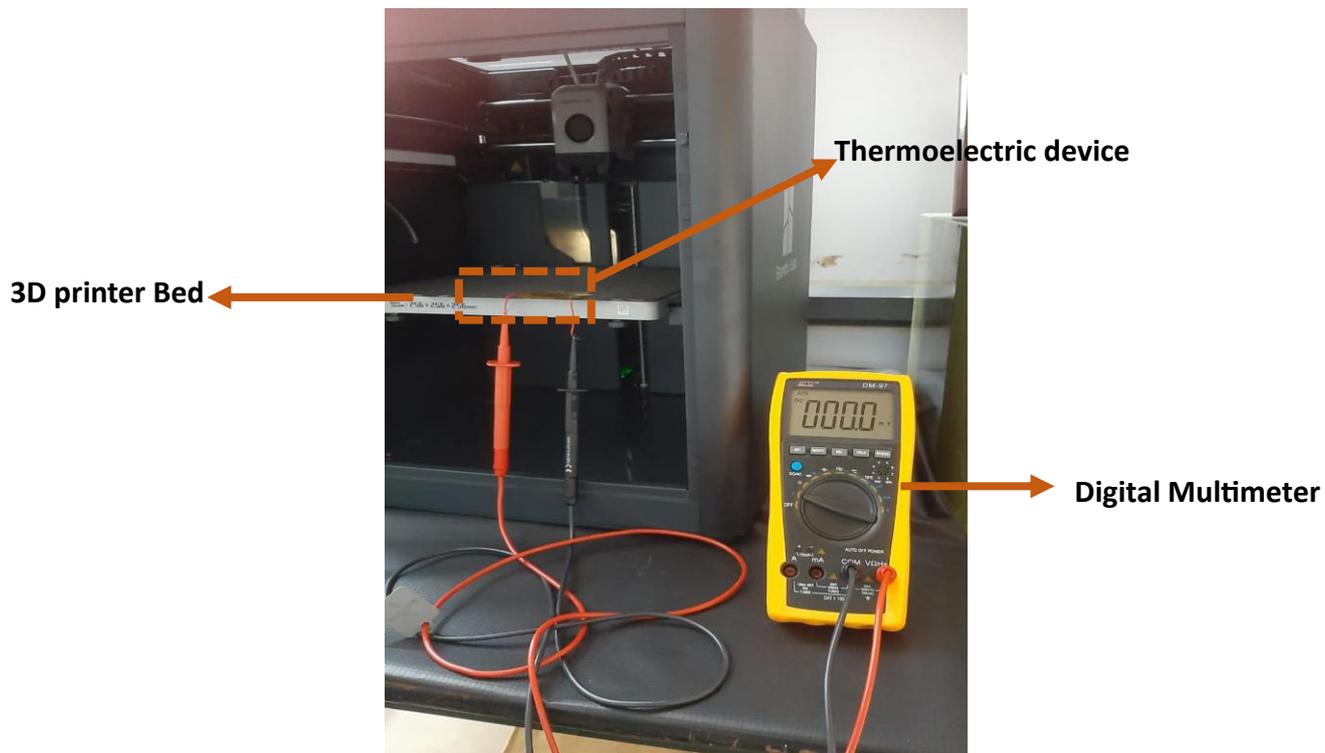
Real-time application

Fig. S6. Photo of the real-time application setup with the 3D printer in ideal condition.
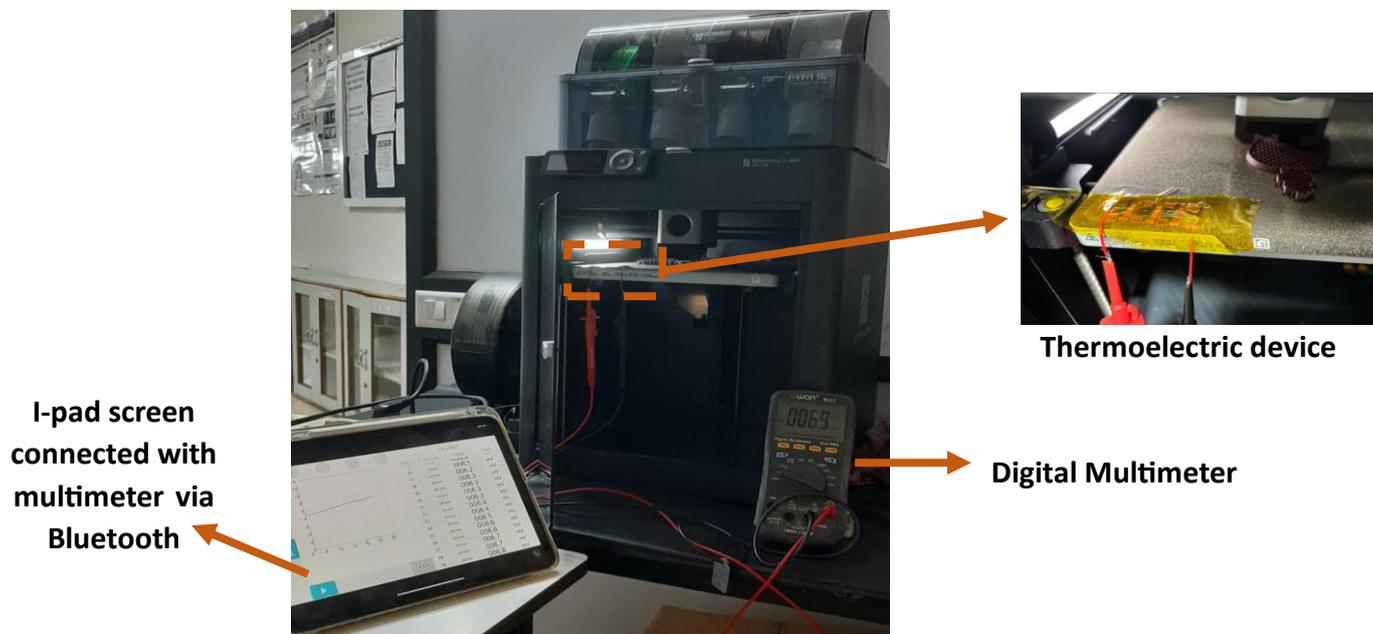

Fig. S7. Photo of the real-time application setup of the thermoelectric device with the operational 3D printer.