Supporting Information for:

Vibration reduction ability of MWCNT PVAc composites measured under high frequency for acoustic device application

Zhaowei Wang,[a] Raymond L.D. Whitby, *[a] Sergey V. Mikhalovsky,[a] Martial Rousseau,[b] Stuart Nevill,[b] Gary Geaves[b]
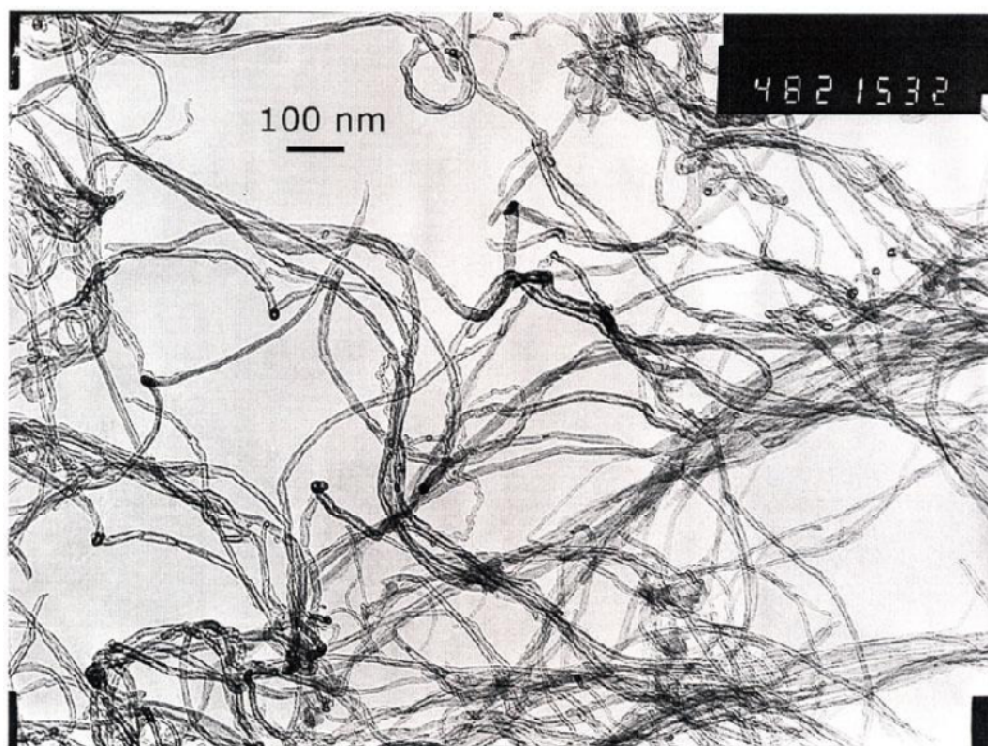
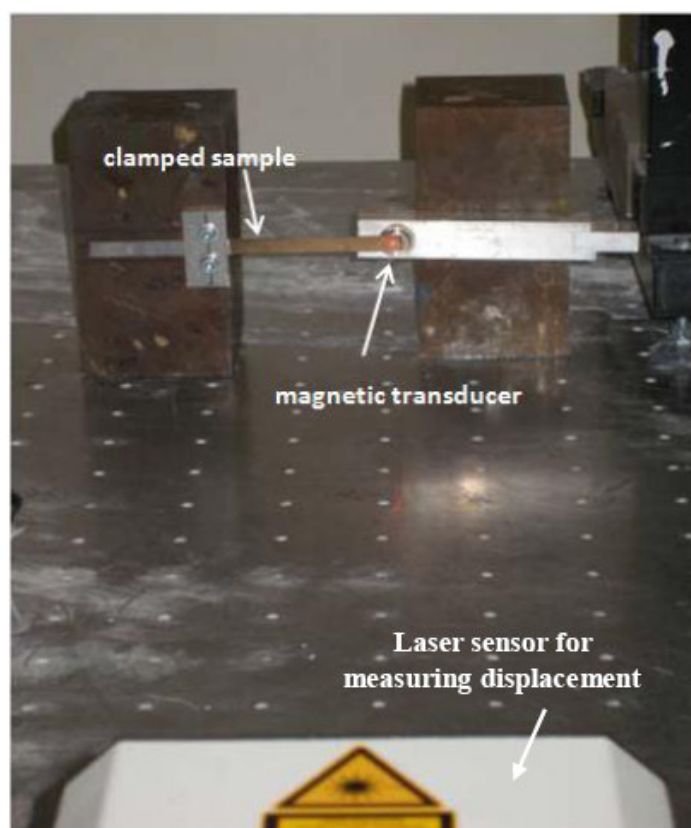**Fig. S1** TEM image of commercial MWCNTs from TMSpetsmash, Ukraine.

Fig. S2 Experimental setup for frequency response measurement of MWCNT/PVAc composites (maximum excitation frequency is 5 KHz).
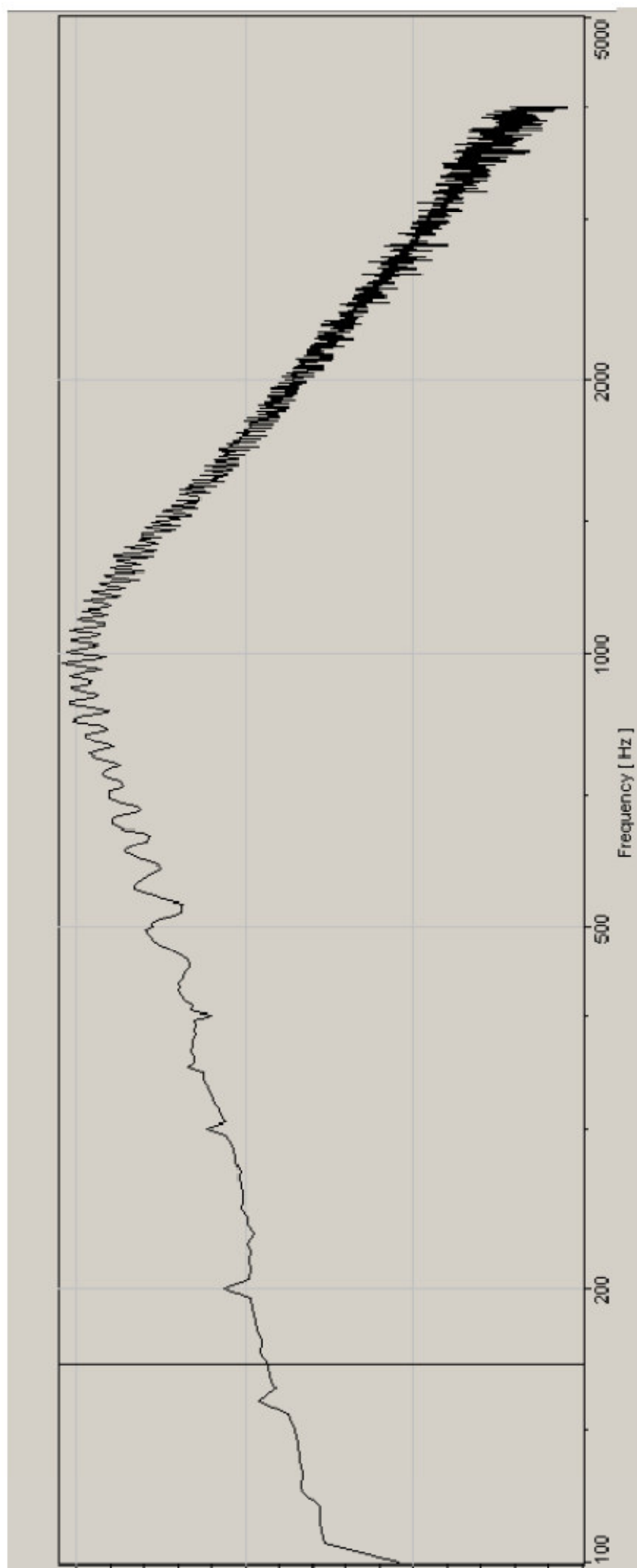
Fig. 3S Frequency response spectrum for 0.5 wt% pristine MWCNT/PVAc composites. The Y-axis represents sample displacement.
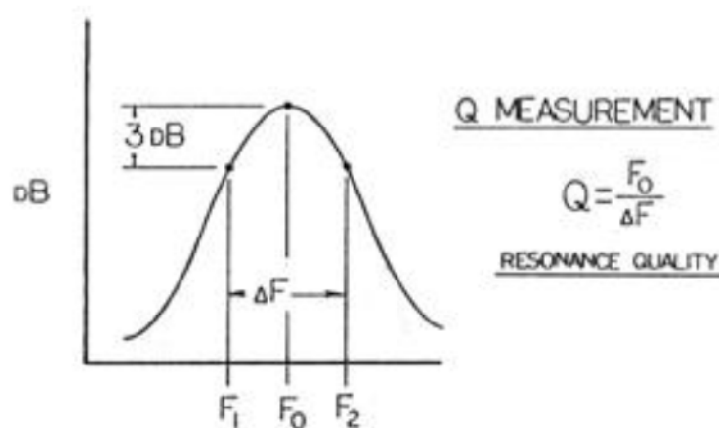
Fig. S4 Illustration of half-power bandwidth.

In designing 3D FE model, the input parameters are sample geometry, density, damping ratio and poisson ratio which is a constant of 0.3 for all PVAc and their MWCNT composites. In the FE analysis, it is assumed that:

- Constraints: the edge of the sample is clamped to an infinitely rigid surface;
- A force is applied at the end of the beam and the resulting displacement is calculated at the same node;
- A viscoelastic material law is applied for the material: it is defined as a complex dynamic Young's modulus.

All the parameters are known apart from the Young's modulus, which is adjusted until the simulated displacement matched the measured one.
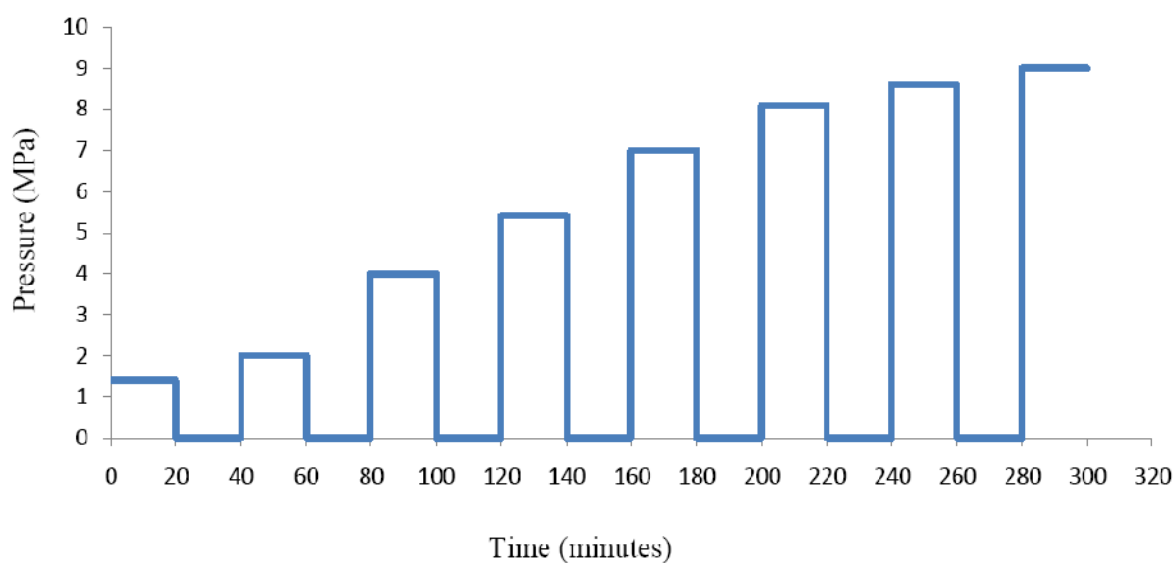

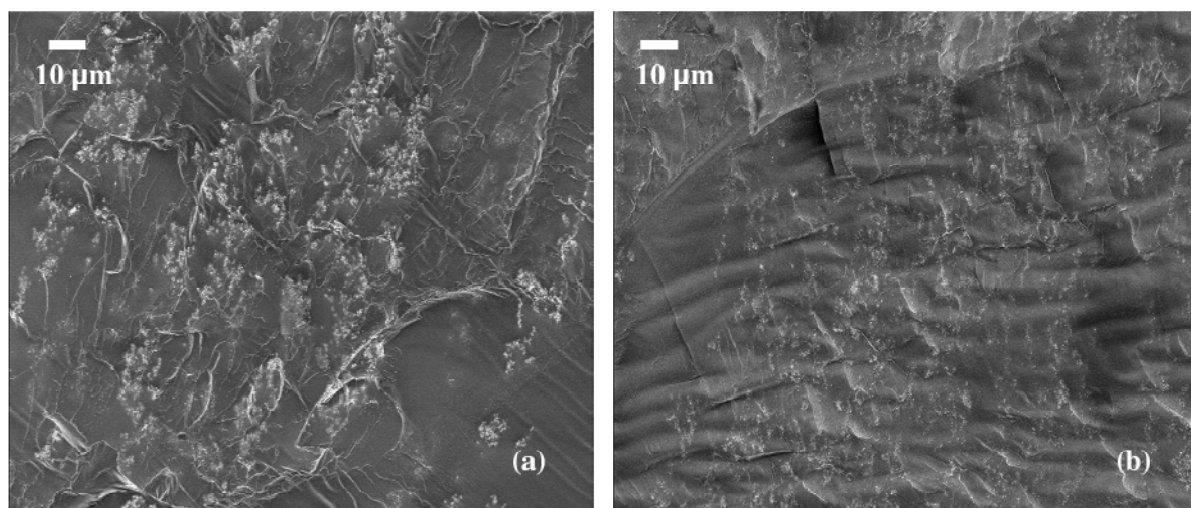**Fig. S5** Time against pressure during hot-pressing.

Fig. S6 SEM images of the fracture surface after immsing in liquid N_2 for 0.5 wt% PVAc with pristine MWCNTs (a) and MWCNT-CH=CH-PVAc (b).
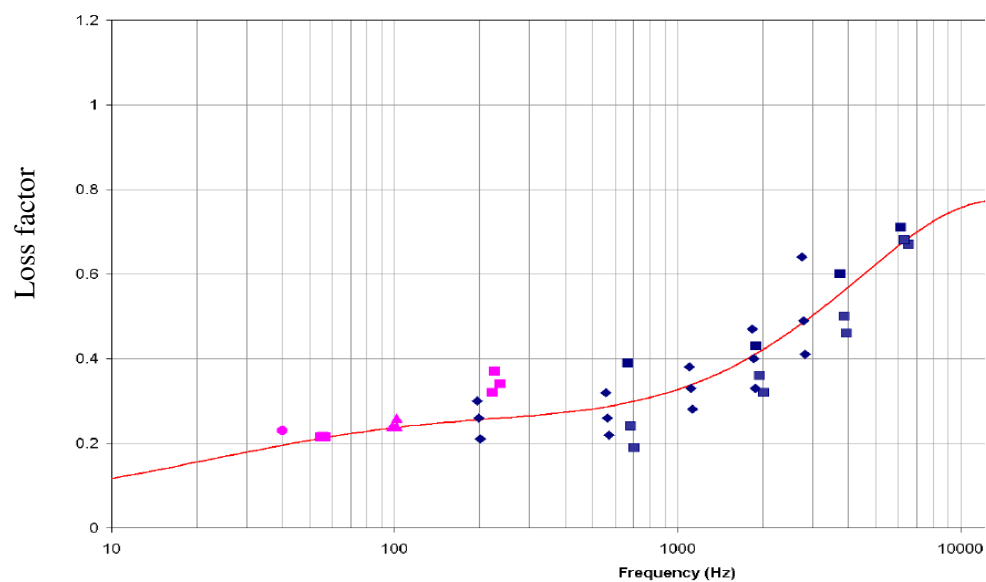

Fig. S7 Loss factor (η) against frequency (Hz) of pure PVAc.