**Effect of sulfonated poly (ether ether ketone) on the sensitivity of polyvinylidene fluoride-based resistive humidity sensors**

Shoaib Mallick1, Zubair Ahmad2\*, Abubaker Eribi3, Hemalatha Parangusan2, Jolly Bahadra3, Muhammad K. Hassan2, Noora J. Al-Thani3, Farid Touati1, and Shaheen Al-Muhtaseb3

1Department of Electrical Engineering, Qatar University, 2713 Doha, Qatar.

2Centre for Advanced Materials (CAM), Qatar University, 2713 Doha, Qatar.

3Qatar University Young Scientists Center, Qatar University, 2713 Doha, Qatar.

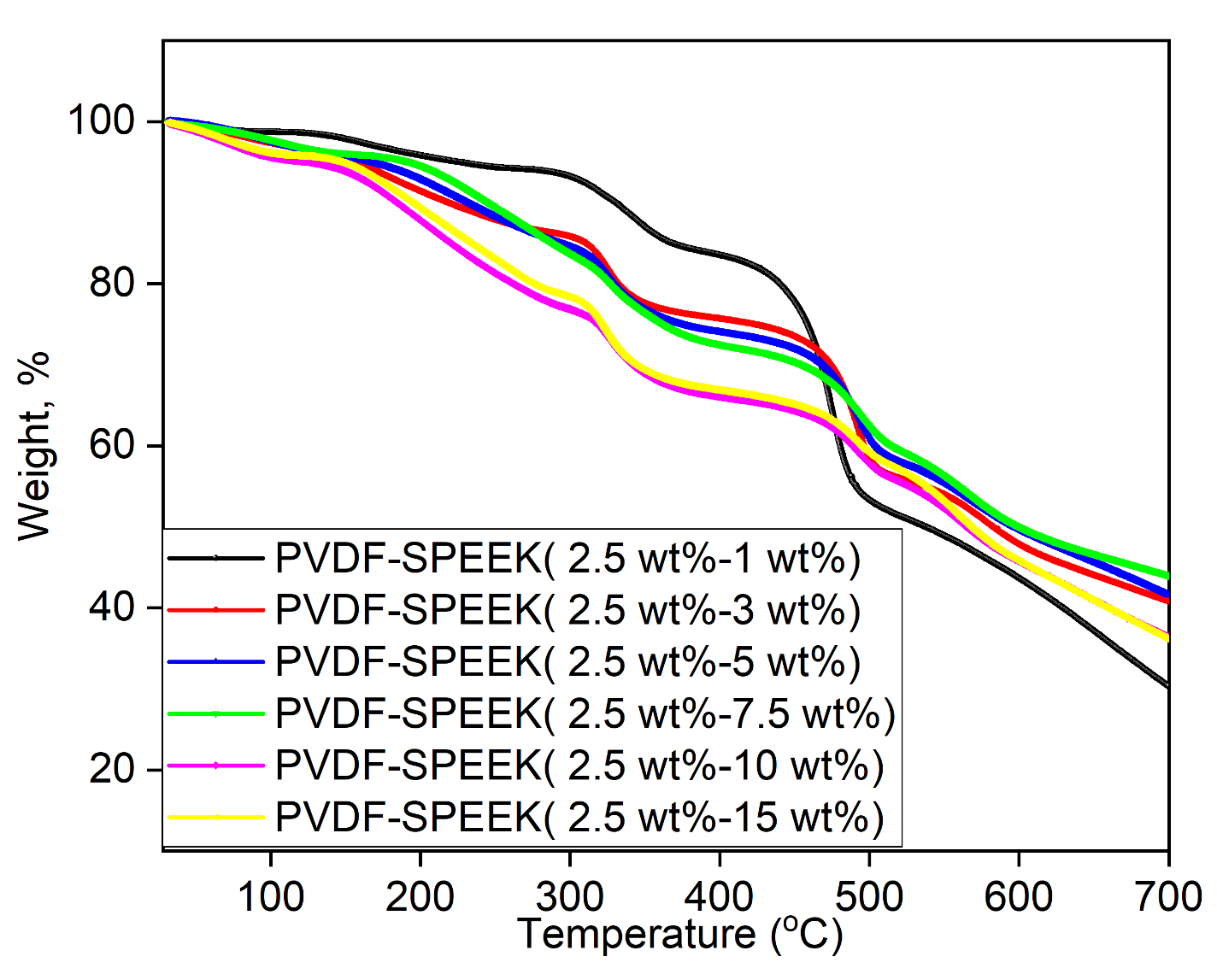
4Department of Chemical Engineering, Qatar University, 2713 Doha, Qatar.

\* Corresponding author:

Email: [zubairtarar@qu.edu.qa](mailto:zubairtarar@qu.edu.qa)

Ph: +974 4403 7729

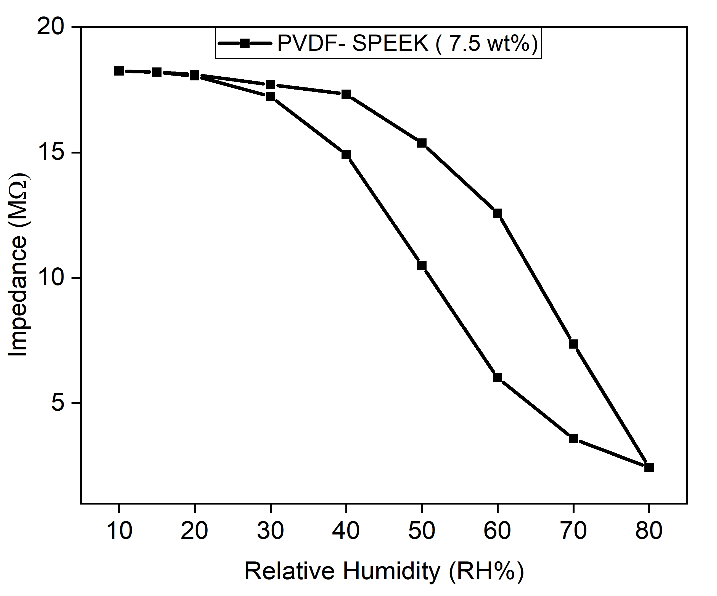
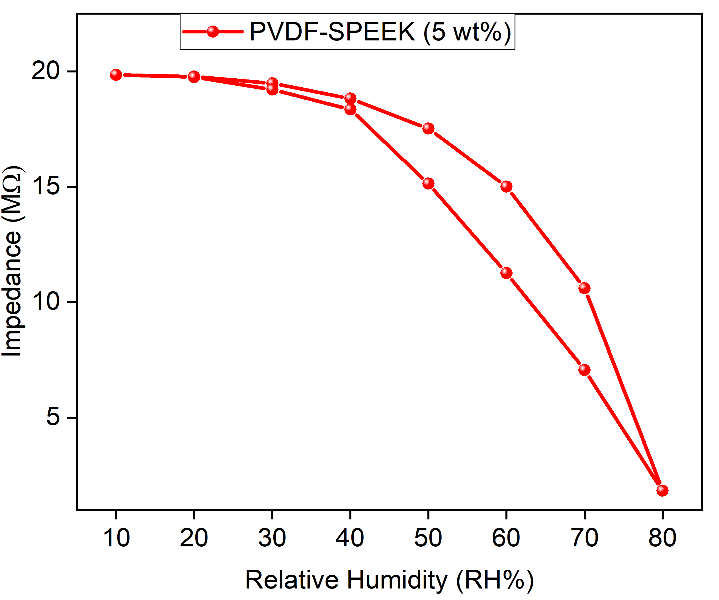
**Supplementary Data:**

**Figure S1:** The TGA response of PVDF-SPEEK blend film with different concentration of SPEEK (1 wt%, 2.5 wt%, 5 wt%, 7.5 wt%, 10 wt%, 15 wt%) while the PVDF concentration is kept constant.

**Table S1:** The nanoindentation characterization to study the mechanical properties the PVDF-SPEEK blend film with different concentrations.

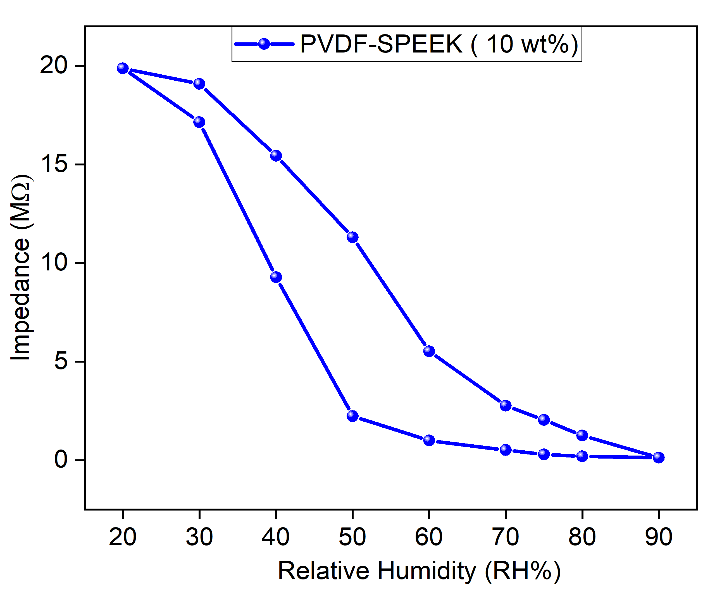
|  |  |  |
| --- | --- | --- |
| **Polymer composite film** | **Youngs modulus** | **Hardness** |
| PVDF-SPEEK (1 wt%) | 12.42 GPa | 3.34 GPa |
| PVDF-SPEEK (5 wt%) | 11.94 GPa | 2.77 GPa |
| PVDF-SPEEK (7.5 wt%) | 11.14 GPa | 2.95 GPa |
| PVDF-SPEEK (10 wt%) | 10.62 GPa | 1.79 GPa |
| PVDF-SPEEK (15 wt%) | 8.56 GPa | 1.31 GPa |

**Figure S2:** The hysteresis response of PVDF-SPEEK blend humidity sensor (a) 5 wt%, (b) 7.5 wt% and (c) 10 wt%.



**(a)**

**(b)**



**(c)**