**Assessment of triboelectricity in colossal-surface-area-lanthanum oxide nanocrystals synthesized via low-temperature hydrothermal process**

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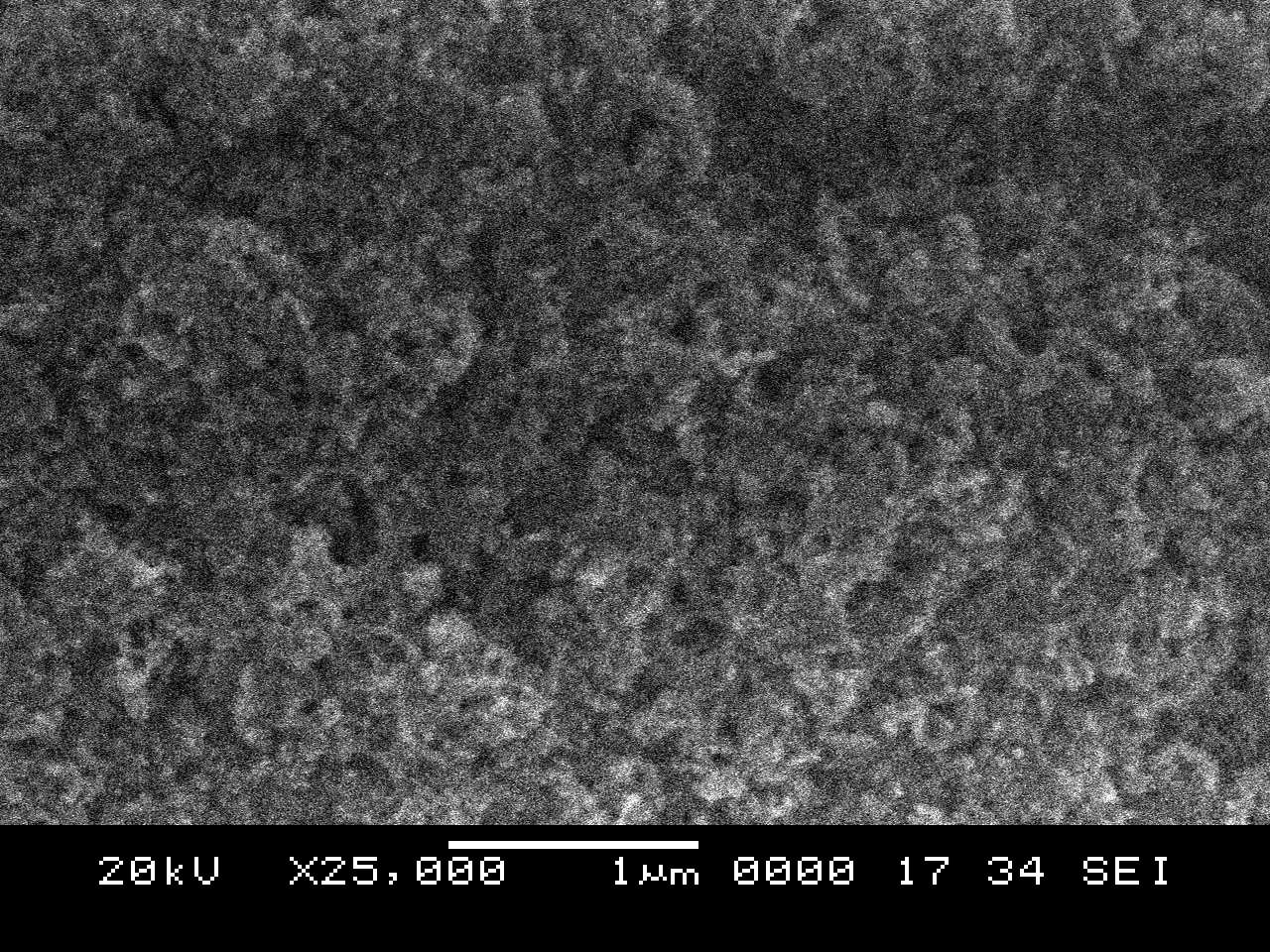
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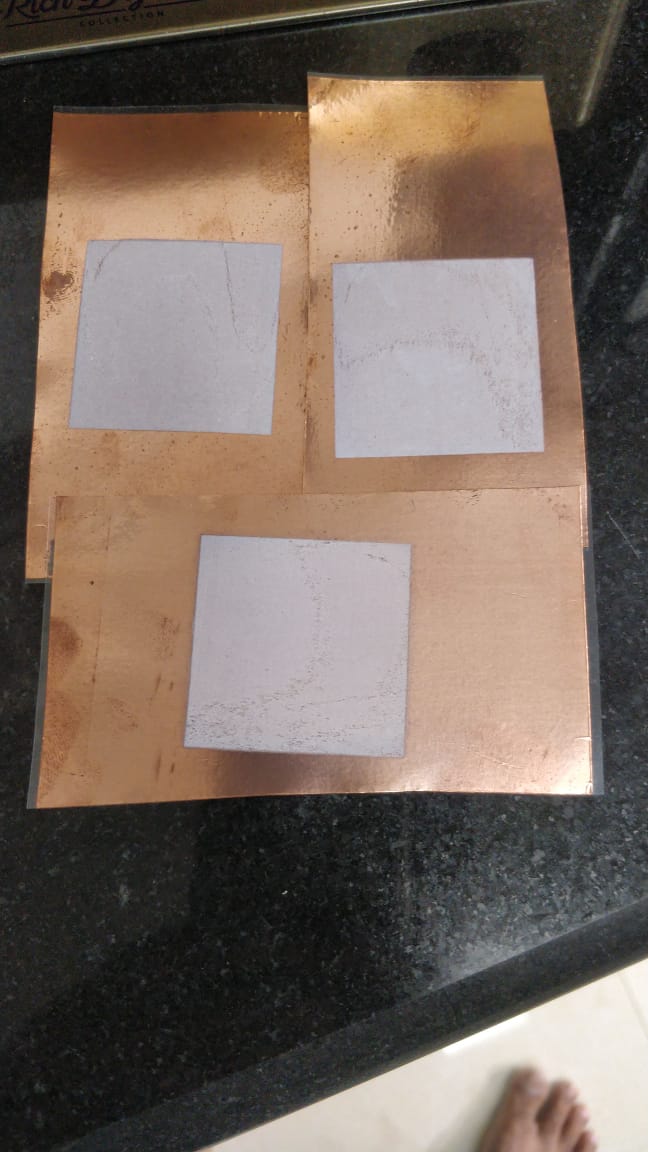
**Supplementary information**

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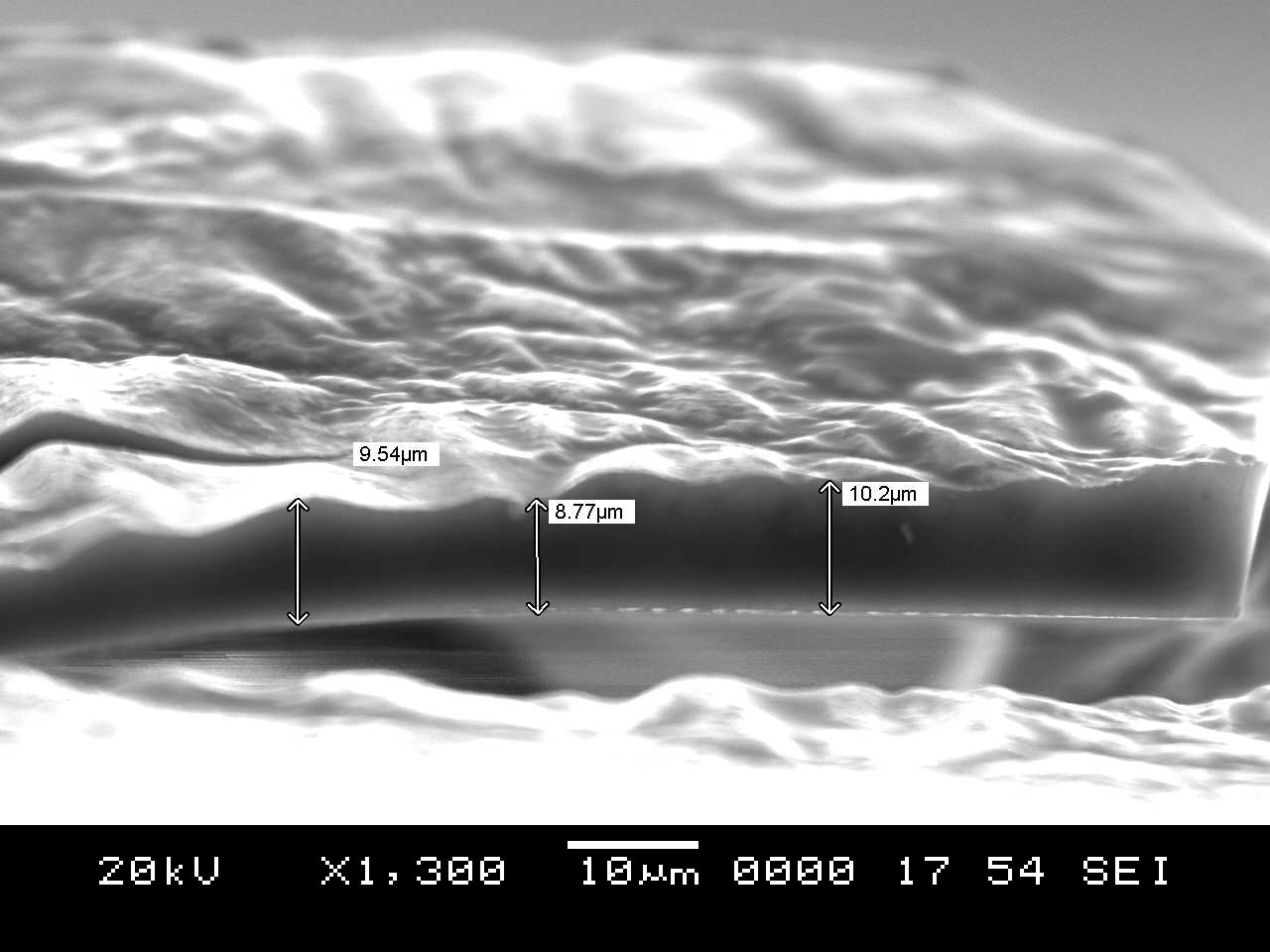
**Fig. S1.** Schematic diagram of external load resistance connection to the La2O3 TENG device.



**(a)**



**(b)**

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**(c)**

**Fig. S2.** (a) SEM morphology of La2O3 screen printed film on copper foil, (b) photograph of La2O3 screen printed film on copper foil and (c) cross sectional SEM micrograph showing the film thickness.

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**Fig. S3. T**he crystal structure of La2O3 (green-lanthanum and red-oxygen).

**Table. S1.** Specific surface area of La2O3 nanocrystals published by researchers.

|  |  |  |  |
| --- | --- | --- | --- |
| **Si. No.** | **Method** | **Specific surface area (m2/g)** | **References** |
| 1. | La2O3-SiO2 -  sol-gel and combustion method | 16.7 | [1] |
| 2. | La2O3 - homogeneous precipitation method | 18.76 | [2] |
| 3. | La2O3 - reverse micelle method | 12.5 | [3] |
| 4. | La2O3 - Hydrothermal method | 35.61 | [4] |
| 5. | Precipitation method | 34 | [5] |
| 6. | Physical mixing and impregnation method | 19.44 | [6] |
| 7. | Hydrothermal method | 72.33 | Present work |

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**Fig. S4.** The Raman spectrum of La2O3 nanocrystals.

The Raman spectrum of La2O3 nanocrystals from 1600 to 50 cm-1 is shown in **Fig. S4.** The Raman shifts for La2O3 are present at 104, 190, 282, 407 and 849 cm-1, respectively. The observed bands are in good agreement with the already reported literature [7] [8]. The Raman peaks are due to the polycrystalline nature of La2O3 nanocrystals.

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**Fig. S5.** The schematic showing movement of unshared pair of electrons from the carbon atoms towards fluorine atoms, creating highest electron density/polarity around fluorine atom.

The fluorine content in the Teflon is highly reactive with highest electronegativity. The electronegativity of carbon in the Teflon polymer chain is lower than fluorine. Consequentially, the unshared electron pairs are pulled towards fluorine from the carbon (**Fig. S5**). This phenomenon results in high electron density or polarity around the fluorine atoms.

**References**

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