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### **Supplementary Information**

#### **One step deposition of PEDOT films by Plasma Radicals Assisted Polymerization *via* Chemical Vapour Deposition**

Bianca Rita Pistillo<sup>1\*</sup>, Kevin Menguelti<sup>1</sup>, Nicolas Desbenoit<sup>1</sup>, Didier Arl<sup>1</sup>, Renaud Leturcq<sup>1</sup>, Olga Ishchenko<sup>1</sup>, Martin Kunat<sup>2</sup>, Peter Baumann<sup>2</sup>, Damien Lenoble<sup>1</sup>

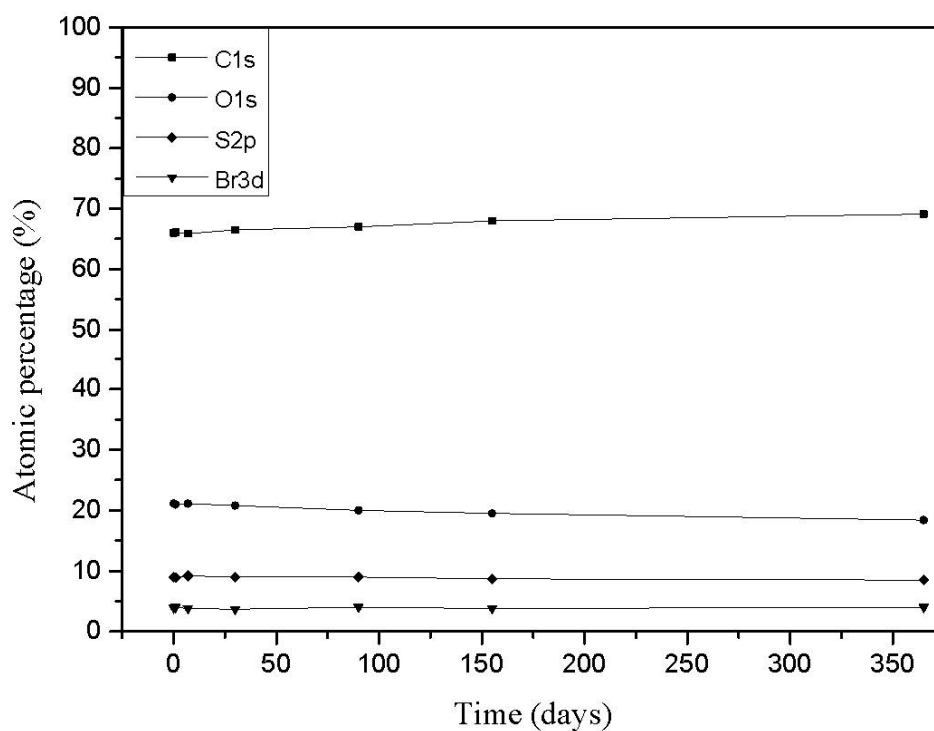
1. Dr B. R. Pistillo, Mr K. Menguelti, N. Desbenoit, D. Arl, O. Ishchenko, R. Leturcq, D. Lenoble

Luxembourg Institute of Science and Technology (LIST), Material Research & Technology Department (MRT), 5, Avenue des Hauts Fourneaux, L-4326 Esch sur Alzette, Luxembourg

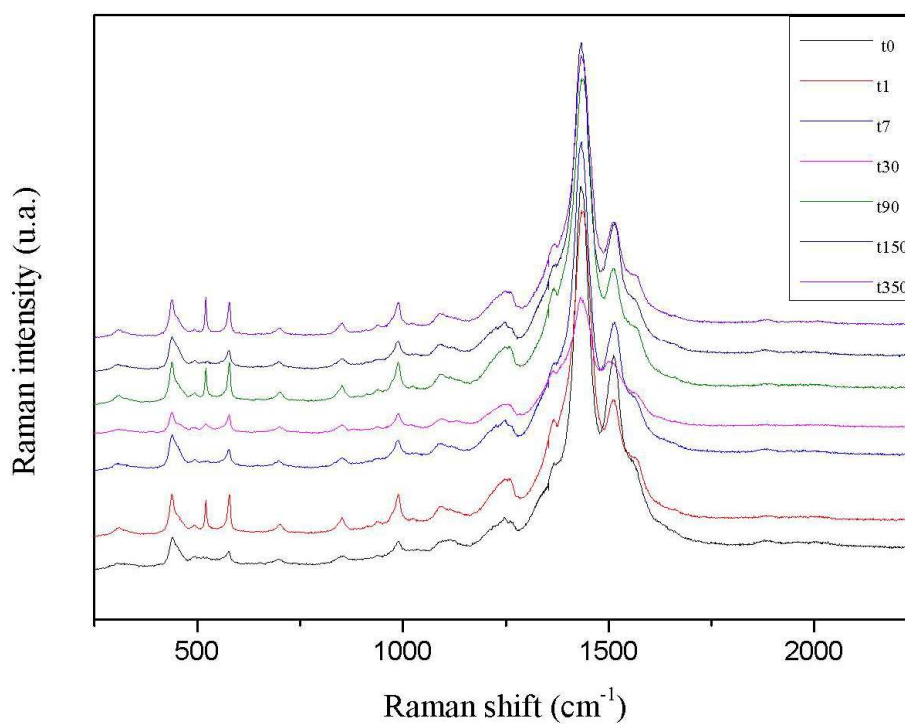
2. Dr M. Kunat, Dr P. Baumann, AIXTRON SE, Dornkaulstraße 2, 52134 Herzogenrath, Germany

Corresponding author: biancarita.pistillo@list.lu

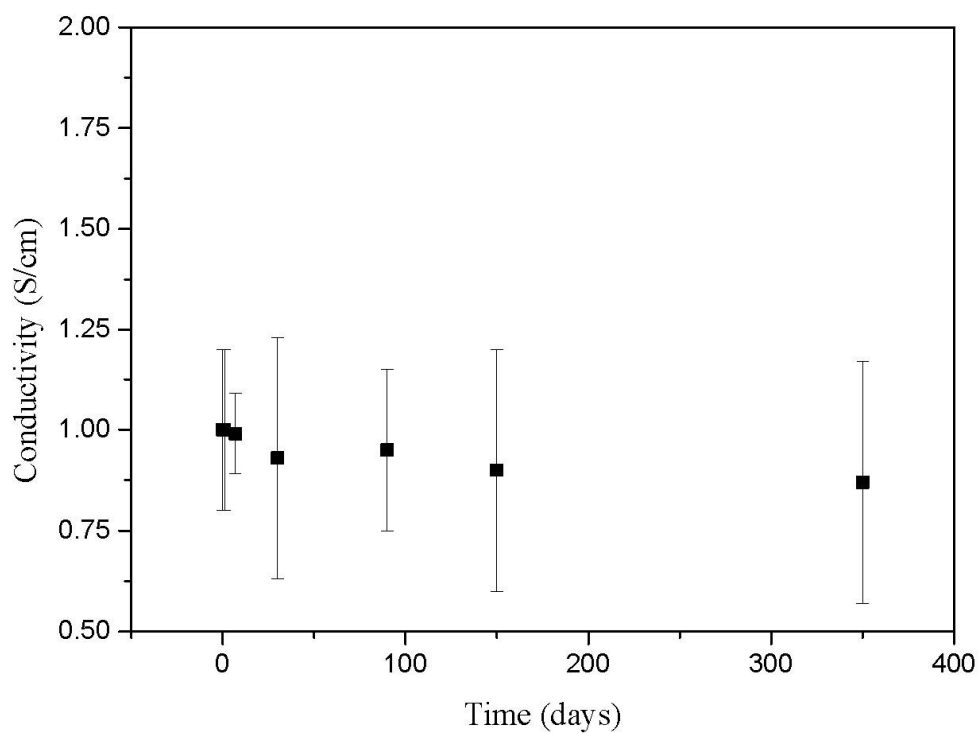
XPS analyses as well as Raman spectroscopy were carried out to check the chemical composition. According to the analyses a slightly amount of C1s was detected compare to the bare film, which can be attributed to adventitious carbon contamination, **Figure S1**. All main peaks of Raman spectroscopy did not suffer of any shift, confirming the stability of film, **Figure S2**. Finally conductivity measurements were monitored all along one year of measurements recorded value passed from  $(1\pm 0.2) \text{ S cm}^{-1}$  to  $(0.85\pm 0.2) \text{ S cm}^{-1}$ , **Figure S3**. Finally no statistically significant degradation was observed on PEDOT films during the ageing study, confirming PRAP-CVD can be a good candidate to bypass all issues related to the degradation of PEDOT film.



**Figure S1** - Atomic percentage trend of PEDOT-Br film collected at different time period by XPS analyses.



**Figure S2** - Raman spectra of PEDOT-Br film recorded all along 1 year.



**Figure S3** - Conductivity behaviour of one PEDOT-Br film measured in 1 year.