

# Insights into plastic degradation processes in marine environment by X-ray photoelectron spectroscopy study

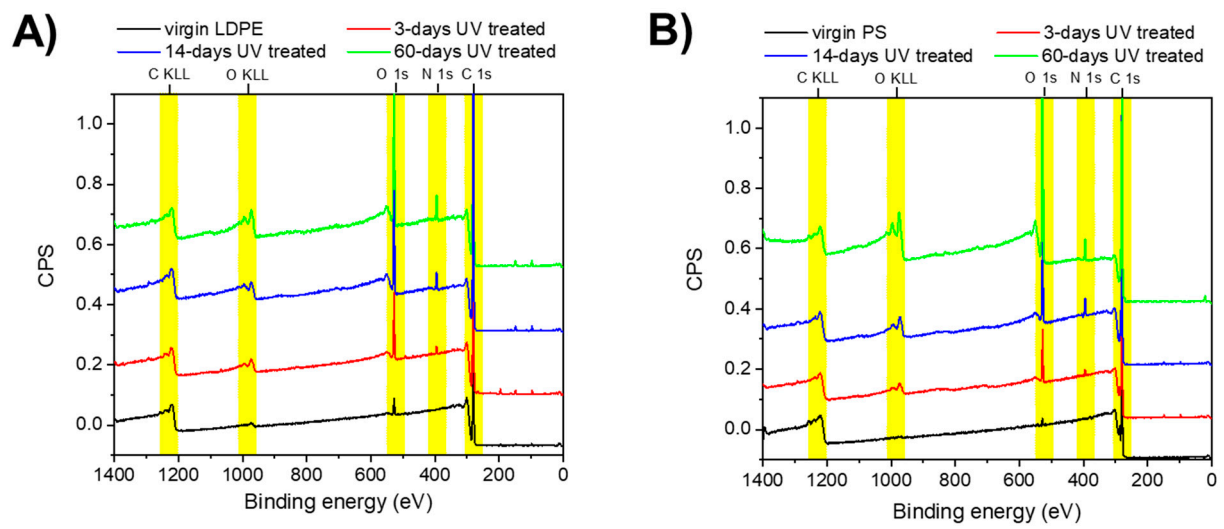
**Tiziano Di Giulio<sup>1</sup>, Giuseppe E. De Benedetto<sup>2</sup>, Nicoletta Ditaranto<sup>3</sup>, Cosimino Malitesta<sup>1</sup>, Elisabetta Mazzotta<sup>1,\*</sup>**

<sup>1</sup> Laboratorio di Chimica Analitica, Dipartimento di Scienze e Tecnologie Biologiche e Ambientali (Di.S.Te.B.A.), Università del Salento, via Monteroni 73100 Lecce – Italy

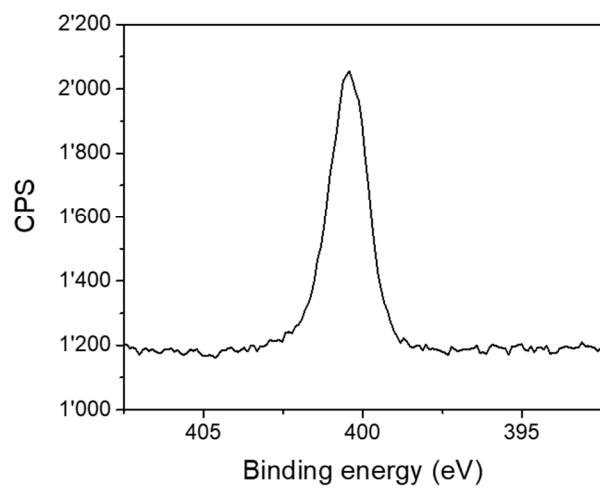
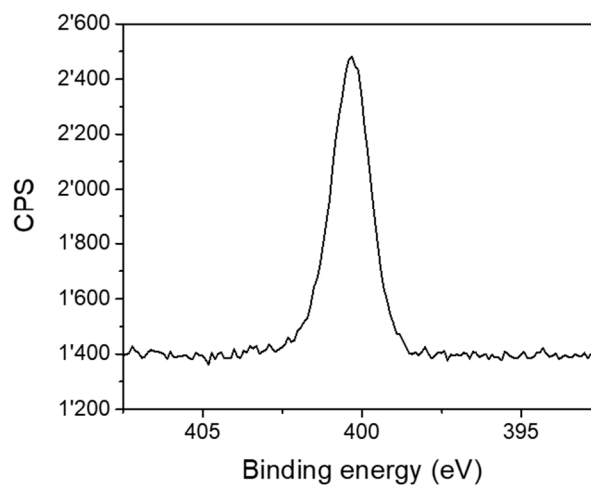
<sup>2</sup> Laboratorio di Spettrometria di Massa Analitica e Isotopica, Dipartimento di Beni Culturali, Università del Salento, via Monteroni 73100 Lecce – Italy

<sup>3</sup> Dipartimento di Chimica and CSGI—Bari Unit, Università degli Studi di Bari Aldo Moro, Via E. Orabona 4, 70126 Bari, Italy

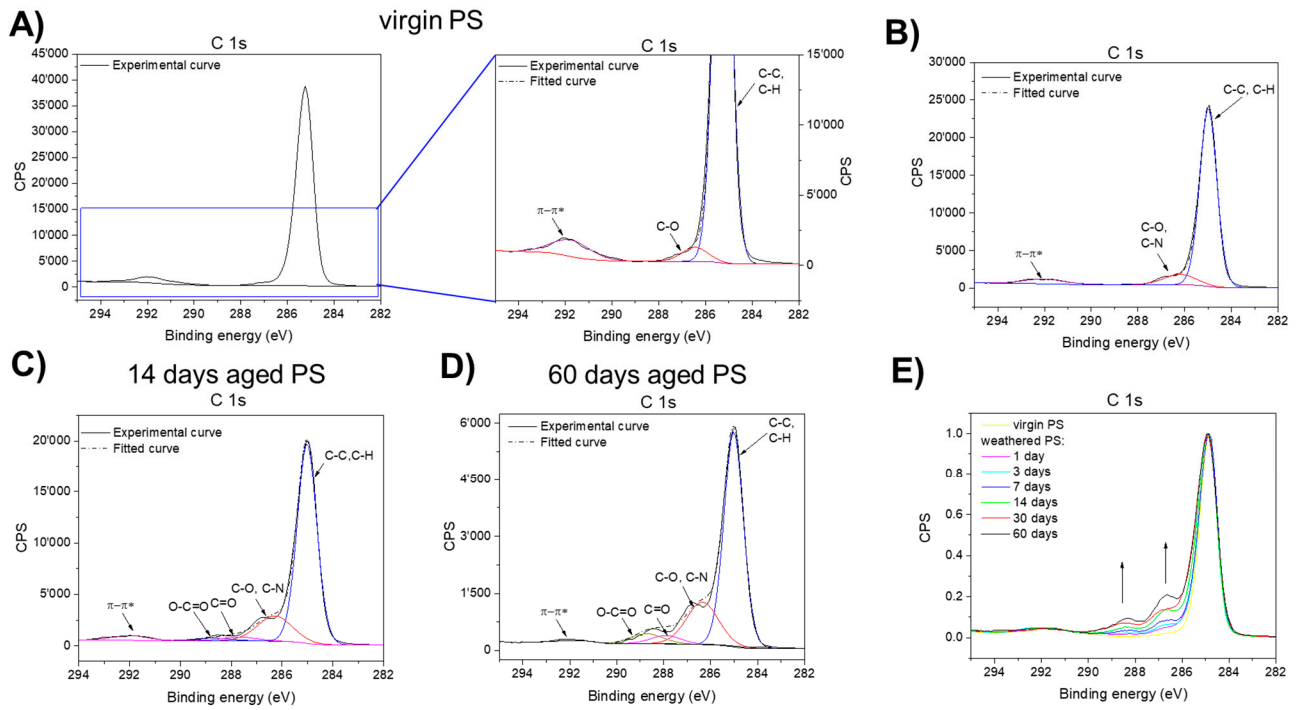
\* Correspondence: [elisabetta.mazzotta@unisalento.it](mailto:elisabetta.mazzotta@unisalento.it)



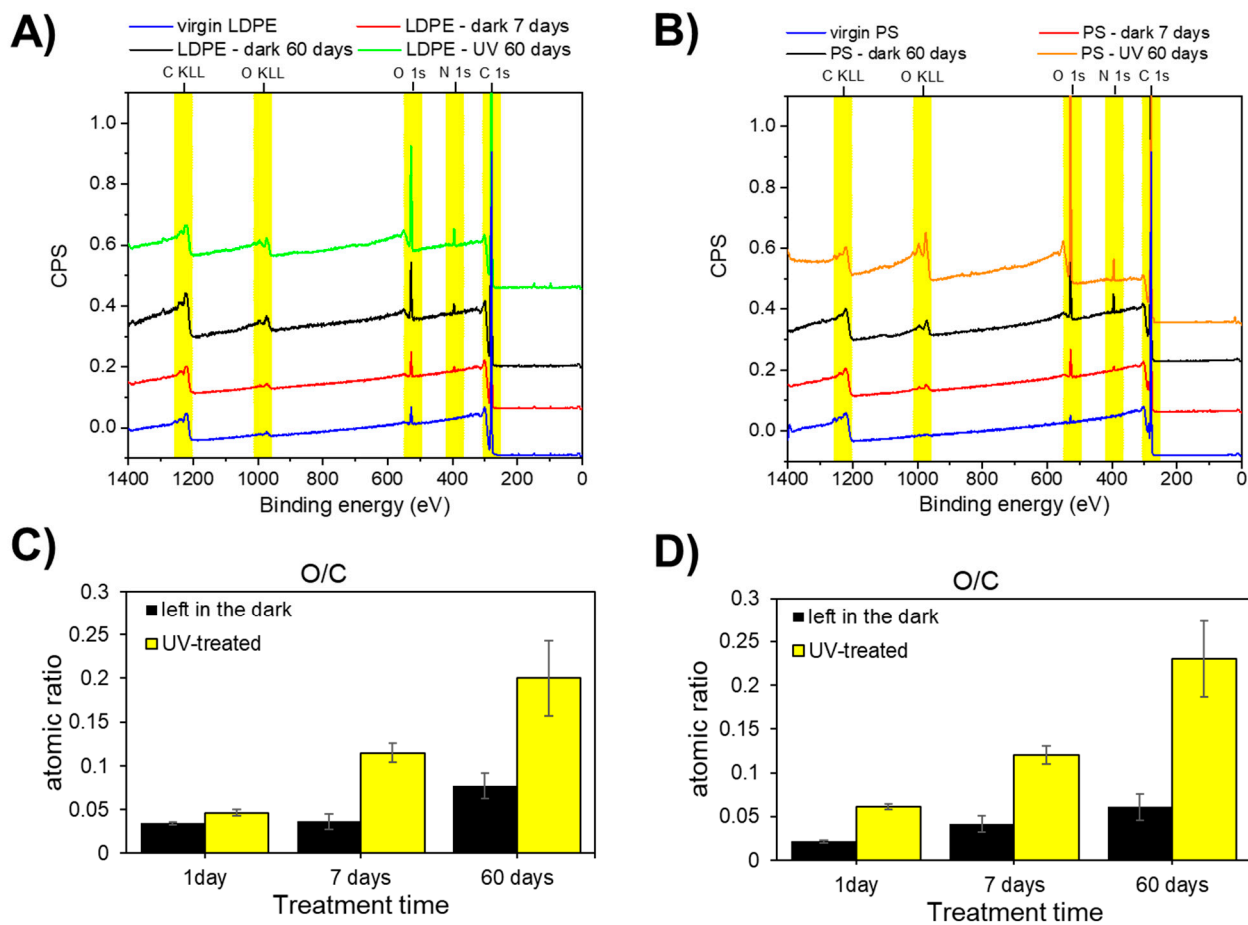
**Figure S1:** XPS wide spectra of LDPE (A) and PS (B) samples before and after 3, 14 and 60 days of UV-radiation artificial weathering.

**A)****B)**

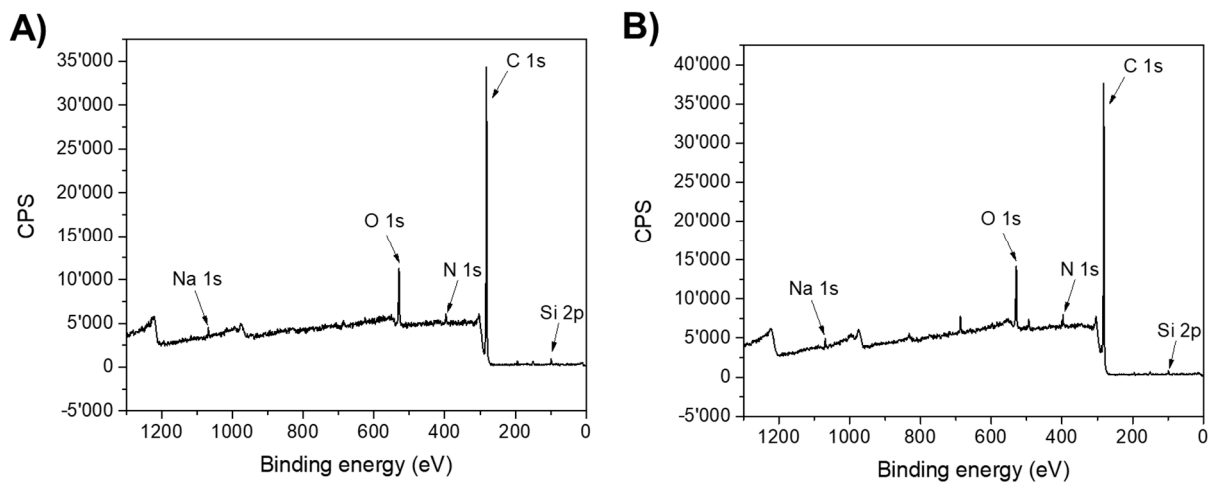
**Figure S2:** High-resolution N1s spectrum on LDPE (A) and PS (B) samples artificially weathered for 14 days.



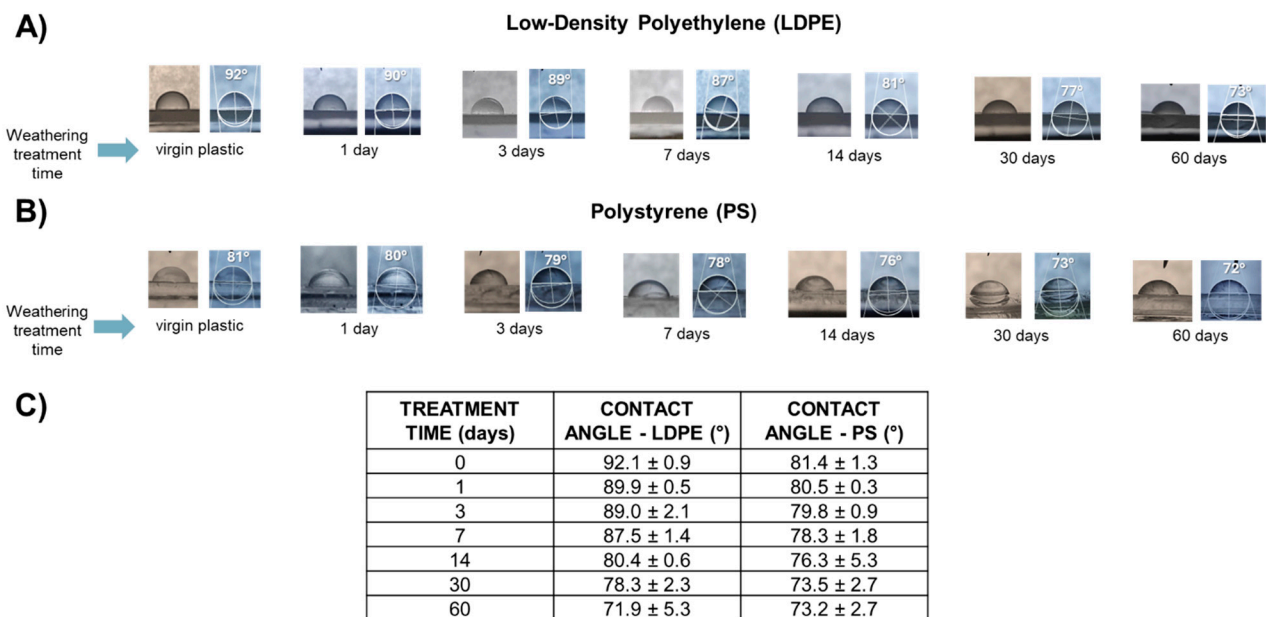
**Figure S3:** High-resolution spectra of C1s signal recorded for: virgin PS (A), 3-, 14- and 60-days aged PS (B, C and D, respectively). F) Comparison of C1s signals recorded on PS at different time weathering.



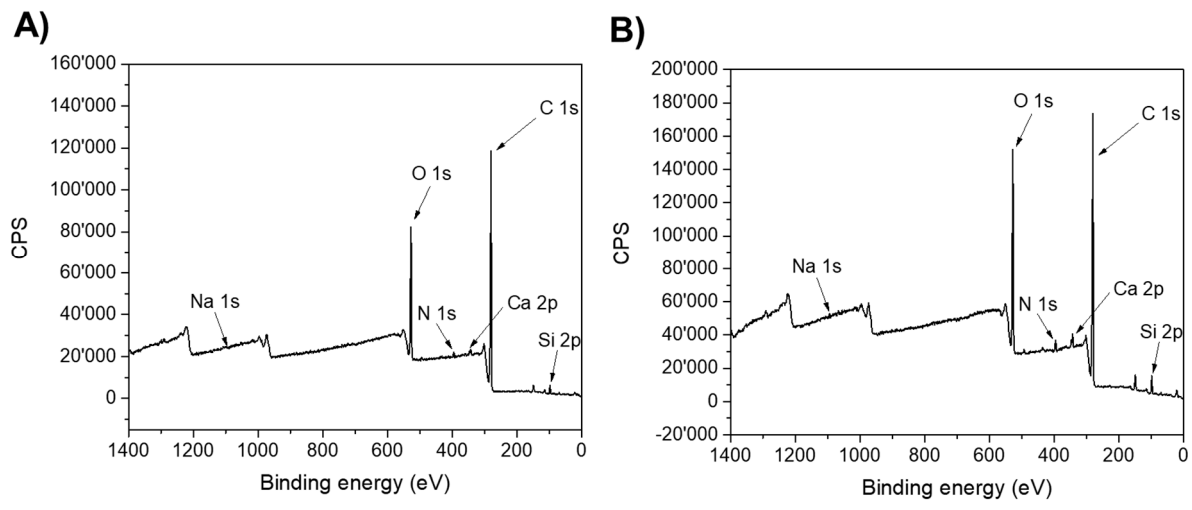
**Figure S4:** XPS wide spectra of LDPE (A) and PS (B) samples before and after 7, 60 days of artificial weathering at dark and 60 days under UV-radiation. O/C atomic ratio calculated from XPS analysis of LDPE (C) and PS (D) samples exposed to artificial weathering under UV-radiation (yellow bars) and at dark (black bars) for different time intervals.



**Figure S5:** XPS wide spectra of LDPE (A) and PS (B) pellets recorded after their UV-weathering treatment (7 days) in marine water.



**Figure S6:** Results of contact angle measurement on LDPE (A) and PS (B) samples exposed to artificial weathering UV-treatment for different time intervals. C) Summary and comparison of the measured values.



**Figure S7:** XPS wide spectra of LDPE foil (A) and PS cup (B) collected from “La Strea” beach (Italy).