Green Chemistry

ROYAL SOCIETY OF CHEMISTRY

CORRECTION

View Article Online
View Journal | View Issue

Cite this: *Green Chem.*, 2025, **27**, 2776

Correction: Fluorescent carbon dots from birch leaves for sustainable electroluminescent devices

Shi Tang,[a] Yongfeng Liu,[a,b] Henry Opoku,[a] Märta Gregorsson,[a] Peijuan Zhang,[c] Etienne Auroux,[a] Dongfeng Dang,[c] Anja-Verena Mudring,[d] Thomas Wågberg,[a] Ludvig Edman*[a,e] and Jia Wang*[a]

DOI: 10.1039/d4gc90134g

rsc.li/greenchem

Correction for 'Fluorescent carbon dots from birch leaves for sustainable electroluminescent devices' by Shi Tang *et al.*, *Green Chem.*, 2023, **25**, 9884–9895, https://doi.org/10.1039/D3GC03827K.

In the original version of the article the X-ray photoelectron spectroscopy (XPS) data presented in Fig. 3 was not accurately analysed, resulting in certain numerical errors. The corrected Fig. 3 is shown here.

The amended text for the discussion of Fig. 3 is presented below.

The elemental composition and the chemical structure of the bio-CDs were further investigated with X-ray photoelectron spectroscopy (XPS) and Fourier transform infrared (FTIR) spectroscopy. An XPS survey spectrum of a bio-CD film is shown in Fig. 3(a). Three major elements have been identified and their relative atomic concentrations are: C (78.8 at%), N (0.7 at%) and O (20.5 at%). We call attention to the absence of a Mg peak at 50 eV (lower than the XPS detection limit of 0.1 at%), which confirms our earlier conclusion that the chlorophyll *a* in the birch-leaf starting material has been transformed into pheophytin *a* by the heating-induced removal of Mg. We also note with interest that the low N concentration (0.7 at%) in the bio-CDs compared to that of neat pheophytin *a* (7.03 at%) implies that the pheophytin *a* constituent is a minority component in the bio-CD but plays a critical role in the PL property. The repeatability of XPS has been further confirmed by additional measurements, which present striking similarity (Fig. S7†).

Fig. 3(c)–(e) present the high-resolution XPS spectra of (c) C 1s, (d) N 1s and (e) O 1s photoelectron lines, which provides additional information on possible chemical bonding of the carbon, oxygen, and nitrogen atoms in bio-CD film.[1] The successful "sum" fitting (solid black line) of the measured XPS spectrum (dotted grey line) shows that the carbon atoms are primarily involved in C–C bonds (at 285.0 eV), which consists of the graphene-like interior structure observed by HRTEM. In addition, a smaller fraction of the carbon atoms is attributed to C–O/C–N bonds (286.4 eV), C═O bonds (288.1 eV) and COOH bonds (289.4 eV). These bonds can be easily found in pheophytin *a* (see Fig. 1(e)) and other biomolecular species commonly present in birch leaves and dissolvable in acetone (Fig. S1†). These observations further imply that multiple precursors were likely involved in the construction of bio-CDs.

[a]*Department of Physics, Umeå University, SE-90187 Umeå, Sweden. E-mail: ludvig.edman@umu.se, jia.wang@umu.se*
[b]*College of Physical Science and Technology, Yangzhou University, Yangzhou 225002, P. R. China*
[c]*School of Chemistry, Xi'an Key Laboratory of Sustainable Energy Material Chemistry, Xi'an Jiao Tong University, Xi'an 710049, China*
[d]*Intelligent Advanced Materials (iAM), Department of Biological and Chemical Engineering and iNANO, Aarhus University, 8000 Aarhus C, Denmark*
[e]*Wallenberg Initiative Materials Science for Sustainability, Department of Physics, Umeå University, SE-90187 Umeå, Sweden*

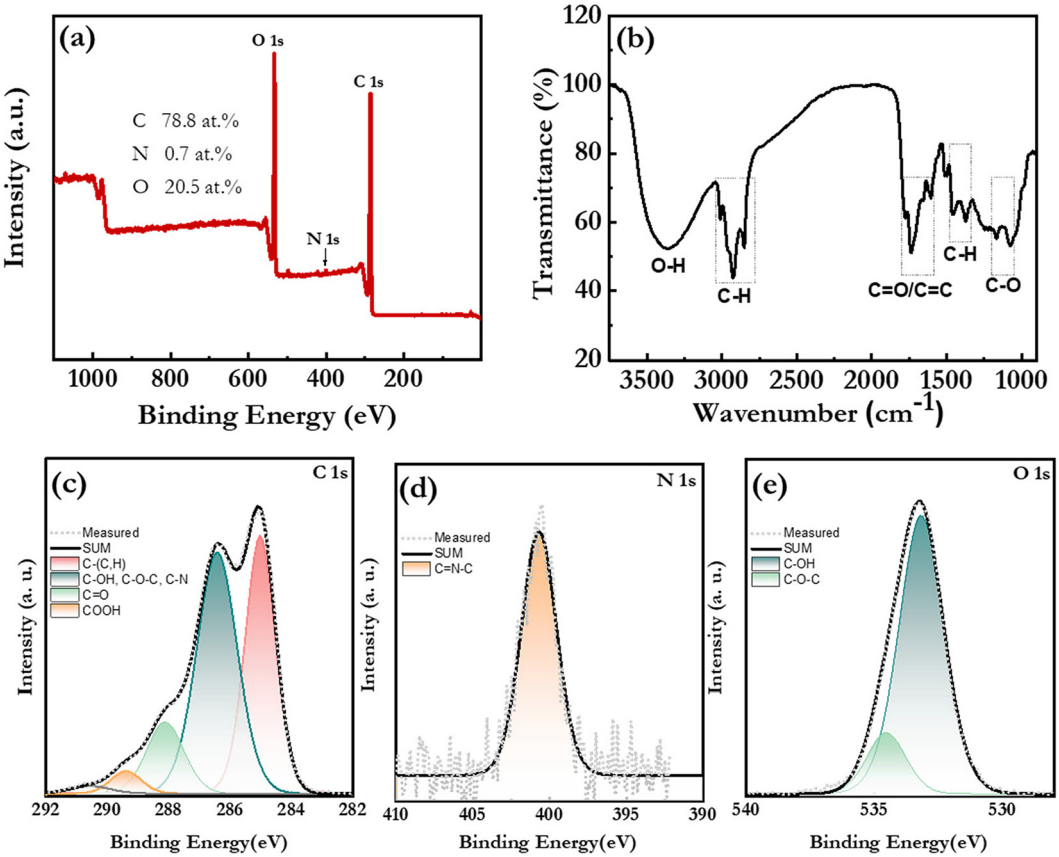

Fig. 3 (a) The XPS survey spectrum of a 200 μm thick bio-CD film on the substrate. (b) The FTIR spectrum of a dry bio-CD powder, with the key vibrational peaks identified by the dashed black rectangles. High-resolution XPS spectra in the (c) C 1s, (d) N 1s and (e) O 1s regions. The measured data are indicated by the grey dots while the fitting data are represented by the solid color lines and shadows. The solid black lines represent the sum of the fitting data. The peak assignments of the fitted spectral components are presented in the inset.

The Royal Society of Chemistry apologises for these errors and any consequent inconvenience to authors and readers.

References

1 G. Beamson and D. Briggs, *XPS of Polymers Database*, SurfaceSpectra Ltd., 2000.