Electronic Supplementary Information

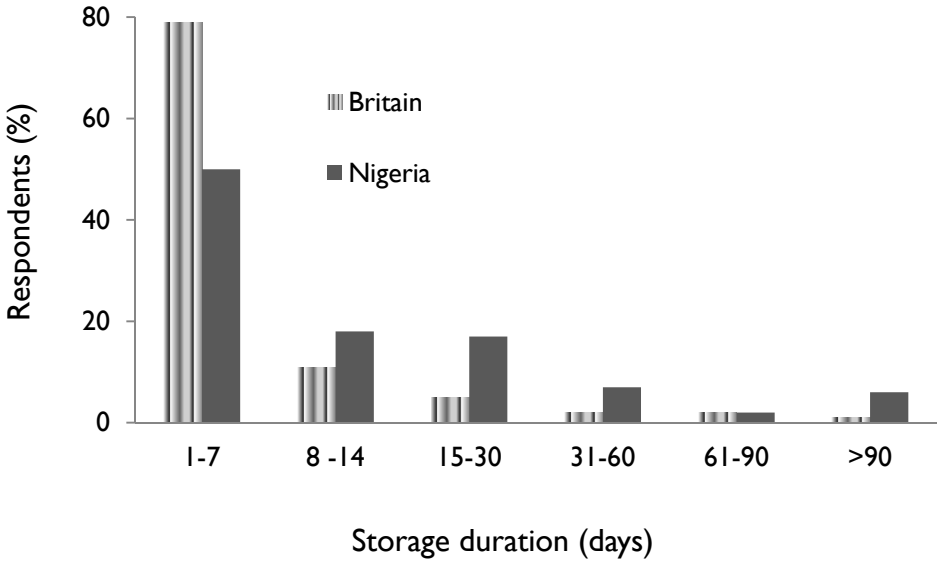

Figure 1 Durations of storage of unopened bottles in places of residence

Comparison of DEHP (dioctyl phthalate) spectrum to that of a Nigerian cap lining spectrum

The 2 spectra in Figure 1 were obtained through Raman analysis of a flexible (plasticised) Nigerian PET bottle cap lining material and a rigid hand wash bottle material coded as PVC. The 2 C-Cl stretching bands (about 635 and 698 cm^{-1}) typical of PVC are common to both spectra. But the other bands strongly suspected to be that of DEHP (also called dioctyl phthalate) are only visible in the Nigerian PET bottle cap lining material. This is expected because the cap lining is flexible signifying the presence of plasticisers which are usually used to make PVC flexible. Figure 2 shows Raman spectra of different phthalate plasticisers including DEHP (labelled as dioctyl). The noticeable resemblance between the plasticiser bands in the Nigerian PET bottle cap lining and the spectrum in figure 2 labelled as dioctyl strongly suggests the presence of DEHP as the used plasticiser in the cap lining material. Pure DEHP was not analysed because it was unavailable. The presence of DEHP or otherwise could have been confirmed using GC-MS. However as a result of limited resources GC-MS experiment for the purpose of confirming the presence of DEHP were not carried out.

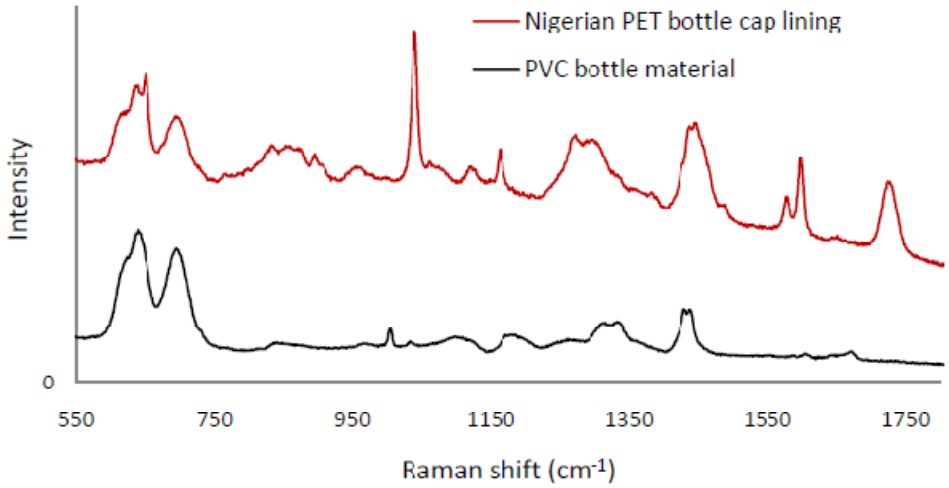

Figure 2 Raman spectra of a flexible (plasticised) Nigerian PET bottle cap lining material and a rigid (unplasticised) hand wash PVC bottle material

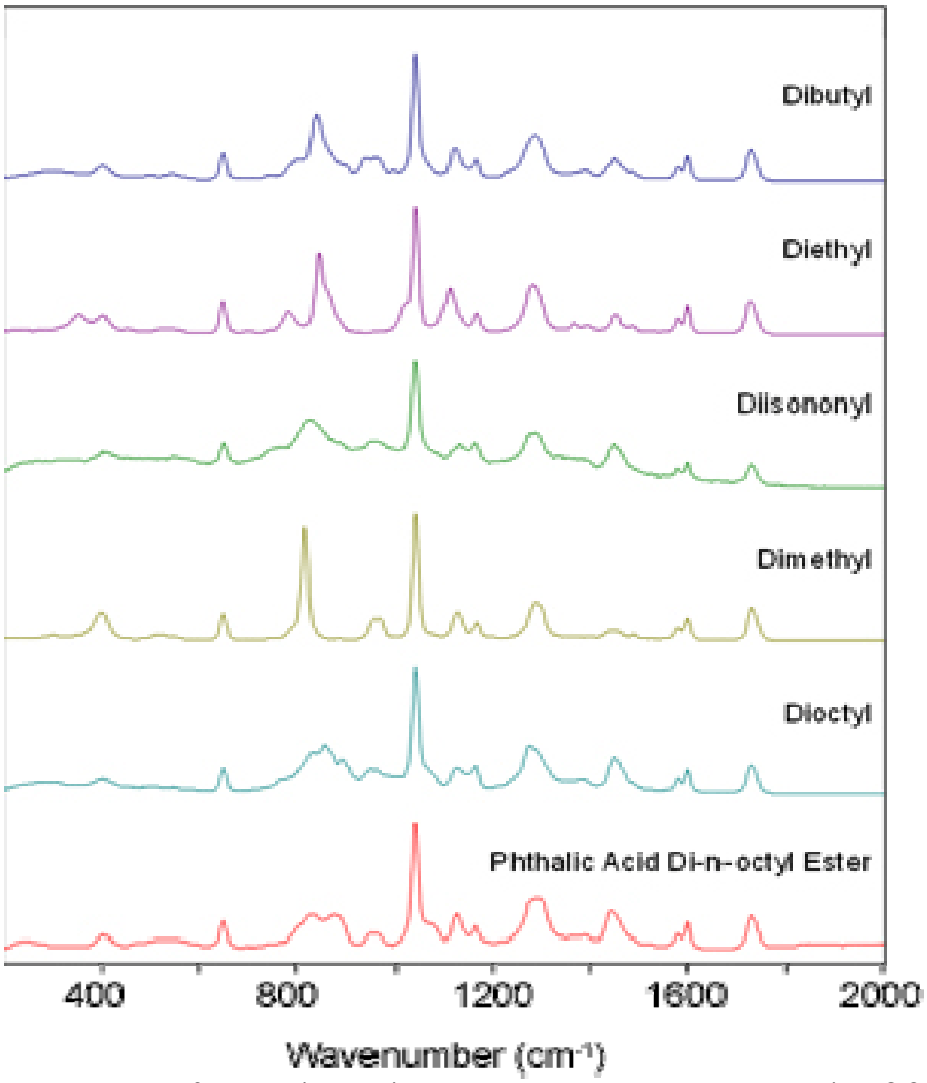

Figure 3 Raman spectra of DEHP (dioctyl) and other phthalate plasticisers (IDES 2011)

IDES (2011) *Raman spectroscopy 101 for plastics identification*. [online] s.l.: IDES. Available from: *http://www.ides.com/articles/materials/2010/Raman-Spectroscopy-Plastics-Identification.asp* [Accessed 8th February 2011]

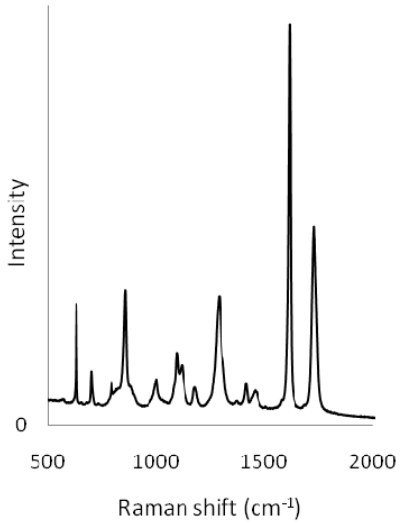

Figure 4 Typical Raman spectrum of PET bottle materials as obtained in this work

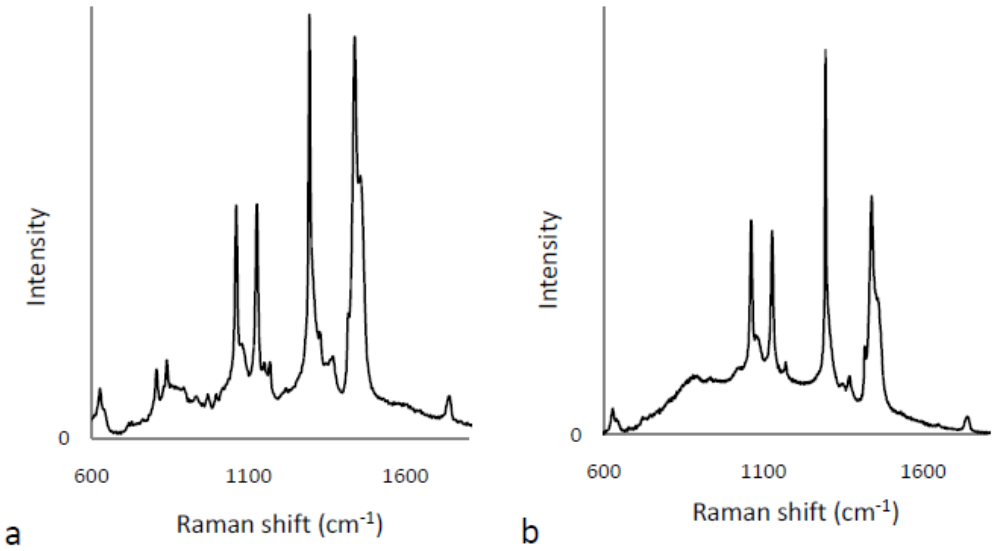

Figure 5 Raman spectrum for British cap lining material (a) compared to Raman spectrum of Ethylene vinyl acetate reference (b)

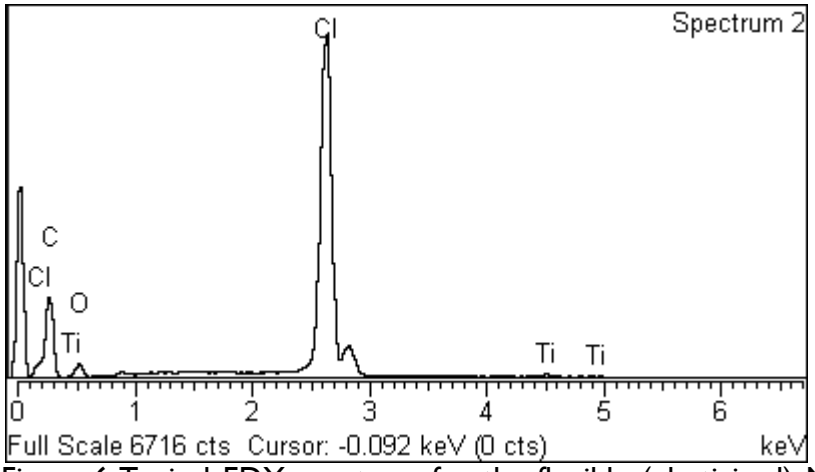

Figure 6 Typical EDX spectrum for the flexible (plasticised) Nigerian PET bottle cap lining material as obtained in this work showing chlorine. The presence of chlorine in the EDX spectrum together with the Raman spectrum in Figure 1 confirms the cap lining to be PVC.

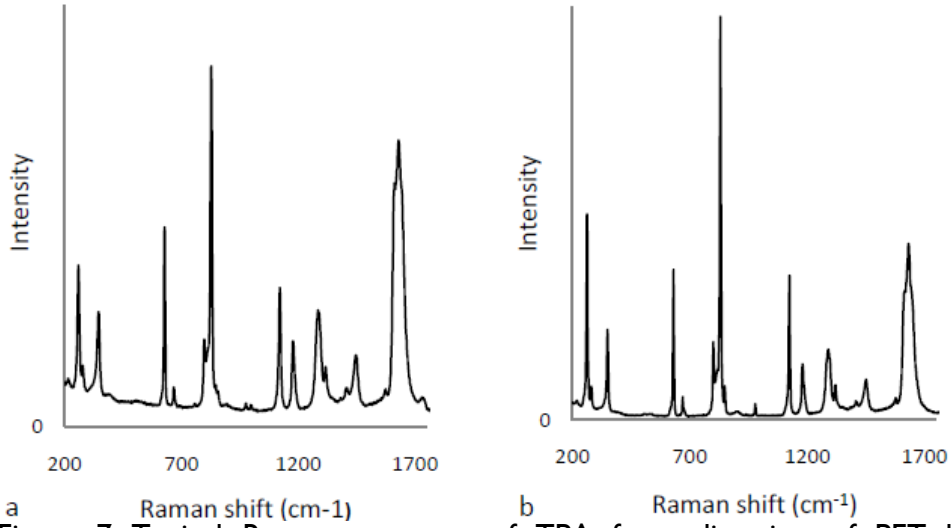

Figure 7 Typical Raman spectrum of TPA from digestion of PET bottle material (a) compared to the spectrum of pure TPA powder (b).

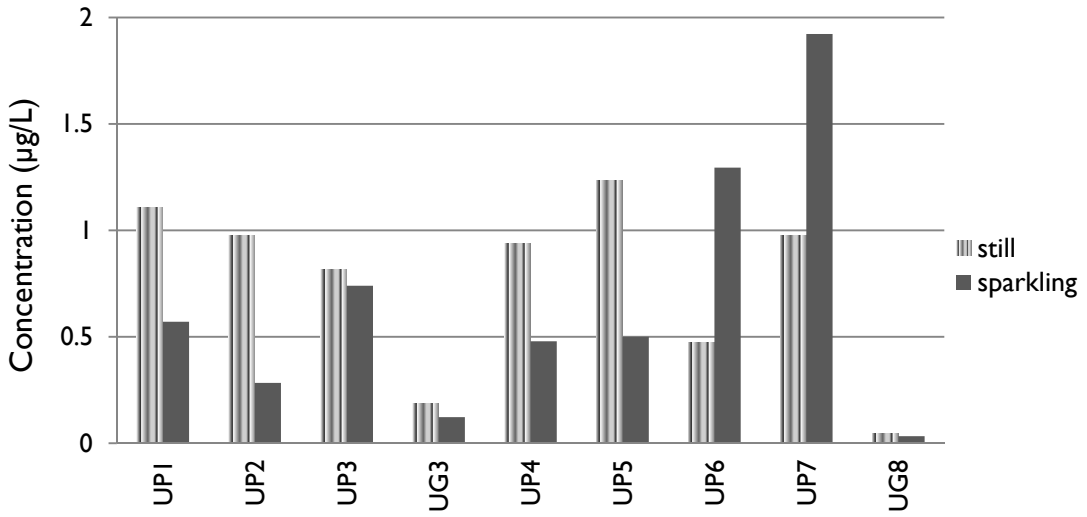

Figure 8 Antimony concentrations in similar brands of still and sparkling water

Table 1 Antimony in tap water, bottled water and soft drinks

Content type	number of samples	number below DL	minimum (µg/L)	Median	maximum (µg/L)	average (µg/L)	number above EU MAC
still water	19	-	0.04	0.87	2.10	0.89	
sparkling water	13	-	0.03	0.57	1.92	0.70	-
soft drinks	15	-	0.73	1.75	6.61	1.98	1
tap water	4	-	0.25	0.26	0.29	0.27	-

Table 2 Antimony in PET- and glass-bottled contents

Bottle type	number of samples	number below DL	minimum (µg/L)	Median (µg/L)	maximum (µg/L)	average (µg/L)	number above EU MAC
PET	35	-	0.15	1.08	6.61	1.31	1
Glass	11	-	0.03	0.61	2.06	0.75	-

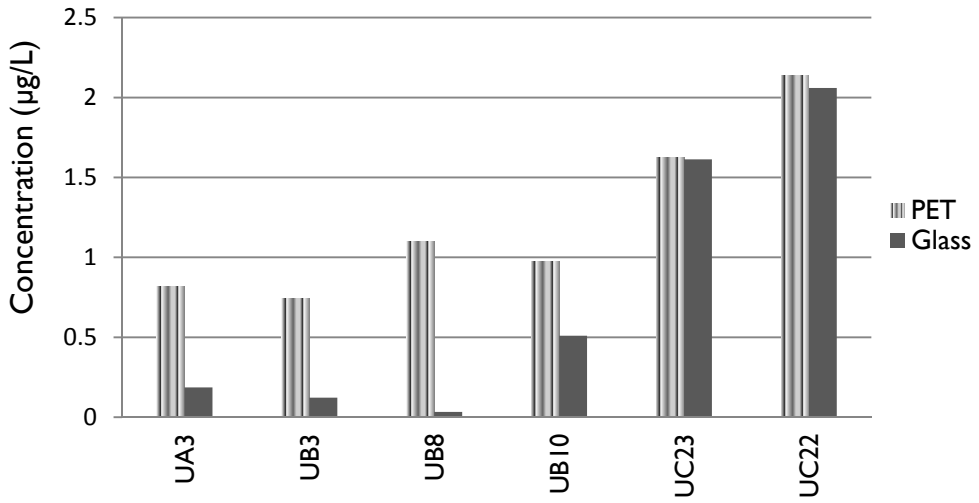

Figure 9 Antimony concentrations in similar brands of water and soft drinks bottled in PET- and glass bottles

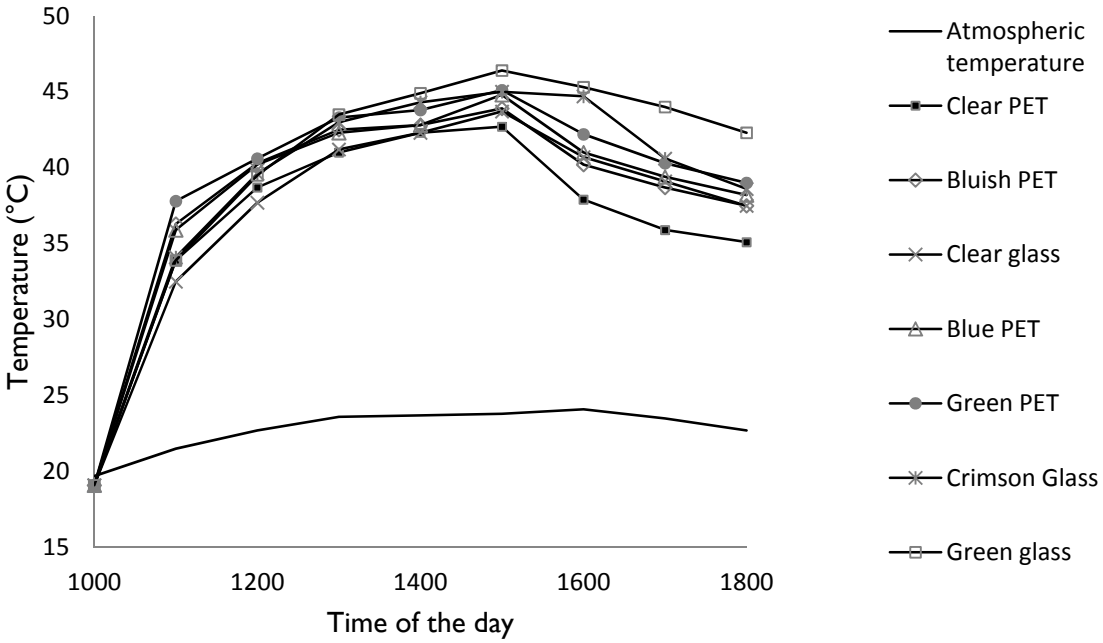

Figure 10 Bottle water temperature elevations in sunlight exposure in Britain

Electronic Supplementary Material (ESI) for Journal of Environmental Monitoring

RESEARCH SURVEY

Preamble: I am a researcher looking on how **clear plastic bottles** are **used** and **reused. Clear plastic bottles** are the bottles used for bottling water and many soft drinks.

1. Do you drink water or drinks bottled in **clear plastic bottles**?

Still water	Yes ○	No ○
Sparkling water	Yes ○	No ○
Bottled drinks	Yes ○	No ○

If you do not drink bottled water or bottled drinks in clear plastic bottles proceed to question 11

Unopened bottled water/bottled drinks in clear plastic bottles

2. How many **unopened** bottles containing bottled water and/or drinks do you have presently at your residence? If you do not have any bottle put *None*. If you do not know put *Don't know*.

   Still water _____ Sparkling water_____ Bottled drinks_____

If you do not have unopened clear plastic bottles at your residence proceed to question 7

3. What size(s) are the **unopened** bottles? (250ml, 500ml, 750ml, 1L, 2L, 3L, *don't know, etc*)

   Still water _____ Sparkling water_____ Bottled drinks_____

4. For how long are the **unopened** bottles in your possession? _____

5. What was the longest time an **unopened** bottle remained unopened in your possession? _____

6. Where are the **unopened** bottles stored? _____

Opened bottled water/bottled drinks in clear plastic bottles (original content)

7. How many **opened** bottles containing bottled water and/or drinks do you have presently at your residence? If you do not have any bottle put *None*. If you do not know put *Don't know*.

   Still water _____ Sparkling water_____ Bottled drinks_____

If you do not have opened bottled water or bottled drinks at your residence proceed to question 11

8. What size(s) are the **opened** bottles? (250ml, 500ml, 750ml, 1L, 2L, 3L, *don't know, etc*)

   Still water _____ Sparkling water_____ Bottled drinks_____

9. Where are the **opened** bottles stored in winter? _____ In summer? _____

Please turn over

10. What was the longest time an opened bottle lasted before the content was used up? If you do not know put *Don't know* _____

Clear plastic bottles filled with drinking water (from tap, etc) or other drinks (Bottle reuse)

11. Do you **reuse** empty clear plastic bottles to store drinking water or other drinks at you residence?
Yes ○ No ○ If yes how many bottles are you **reusing** at present? _____

If you are not reusing clear plastic bottles to store drinking water or other drinks at your residence proceed to question 15

12. A single empty plastic bottle may be **reused** repeatedly to store drinking water or other drinks. Approximately how many times have you refilled the clear plastic bottle(s) you are presently **reusing** in your residence? _____

13. For approximately how long have you **reused** the bottle(s) you are currently using for the purpose of storing drinking water or other drinks? _____

14. What are the sizes of the bottle(s) you **reuse** for storing drinking water or other drinks? (250ml, 500ml, 750ml, 1L, 2L, 3L, *etc*) _____

15. Do you **reuse** clear plastic bottle(s) to store drinking water while on the move? Yes ○ No ○

16. Do you **reuse** clear plastic bottle(s) to store drinking water while at work? Yes ○ No ○

17. If yes to question 15 and/or 16, for how long have you **reused** the bottle(s) you are currently using for the purpose of storing drinking water or other drinks
at work? _____. while on the move?_____.

18. Have you ever chosen not to consume water or drinks stored in a **reused clear plastic bottle** because you think it is unsafe? Yes ○ No ○

19. If yes to question 18, in what way do you think it is unsafe? _____

20. Apart from safety, are there other factors that have influenced your choices about **reusing** clear plastic bottle? Yes ○ No ○ If yes list them_____

21. Country of origin _____

22. Gender _____

23. Age: 19 and below ○ 20-29 ○ 30-39 ○ 40-49 ○ 50-59 ○ 60+ ○

24. Status: Member of staff ○ undergraduate ○ MSc student ○ Research student ○ other student ○