Raman analysis of dilute aqueous samples by localised evaporation of sub-µL droplets on the tips of superhydrophobic copper wires

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Figure S1: Raman spectra showing dried down 0.6 µL drops of glucose at 5×10^{-3} mol dm^{-3} on a MPA treated tip of SHP support and (b) untreated tip of SHP support (with an extra peak at 277 cm^{-1}). Spectra are on the same vertical axis, apart from being offset for clarity.

Figure S2: SEM image of a bare copper wire at 300 ×.

Figure S3: SEM image (a) of 1×10^{-3} mol dm^{-3} aqueous sucrose solution dried down on a 230 µm SHP support at 700 and 1550 ×. The sucrose droplets are similar to the glucose droplets, but tend to burn more easily under the electron beam. Image (b) shows a close up of the damage which eventually gives a rectangular mark on the surface.

Figure S4: Raman spectra showing (a) bulk crystalline sucrose and dried down 0.6 µL drops of different concentrations of sucrose: (b) 1 mol dm^{-3}, (c) 0.1 mol dm^{-3}, (d) 1×10^{-2} mol dm^{-3}, (e) 2.5×10^{-3} mol dm^{-3}, (f) 1×10^{-3} mol dm^{-3} (g) 5×10^{-4} mol dm^{-3} and (h) water. Spectra are on the same vertical axis, apart from being offset for clarity.

Figure S5: Graph showing the PLS regression plot of predicted vs. actual Glucose concentration using 1st derivatives. The data set had one outlier removed to give the best regression plot with two factors. R^2 = 0.9489 and RMS error = 7.1 x 10^{-5} mol dm^{-3} and % RMS = 12.9.

Table S1: Raman bands with corresponding peak assignments for glucose: sucrose mixtures.
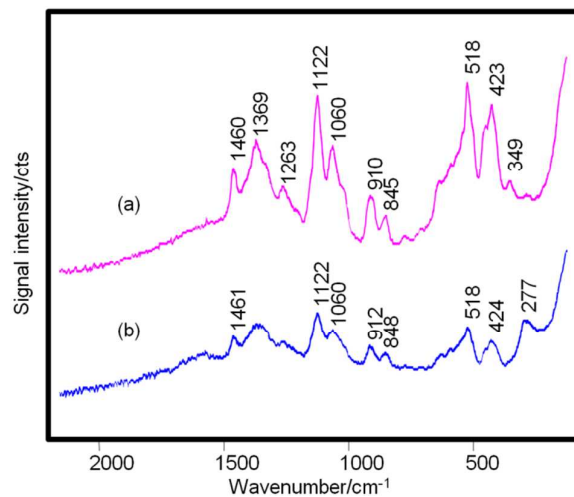
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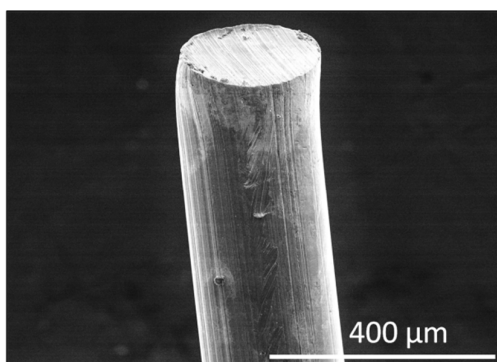

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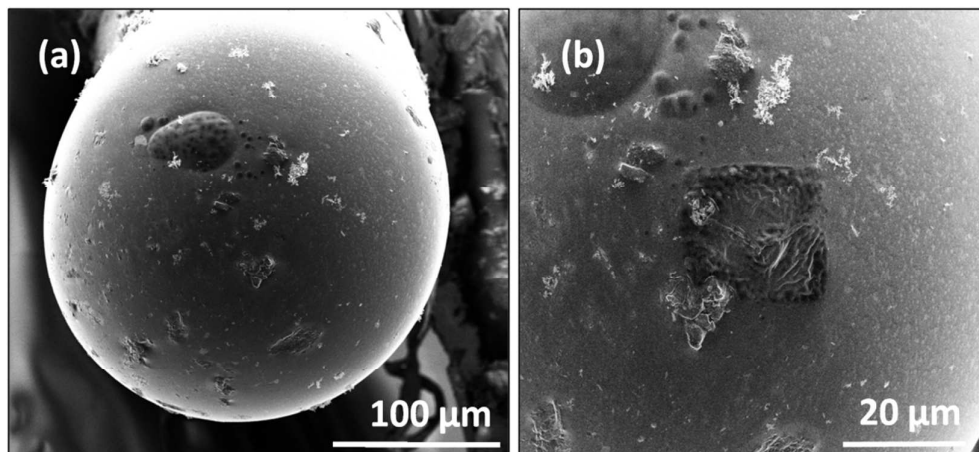Figure S3: SEM image of (a) 1×10^{-3} mol dm^{-3} aqueous sucrose solution dried down on a 230 μm SHP support at 700 and (b) 1550 ×. The sucrose droplets are similar to the glucose droplets, but tend to burn more easily under the electron beam. Image (b) shows a close up of the damage which eventually gives a rectangular mark on the surface.
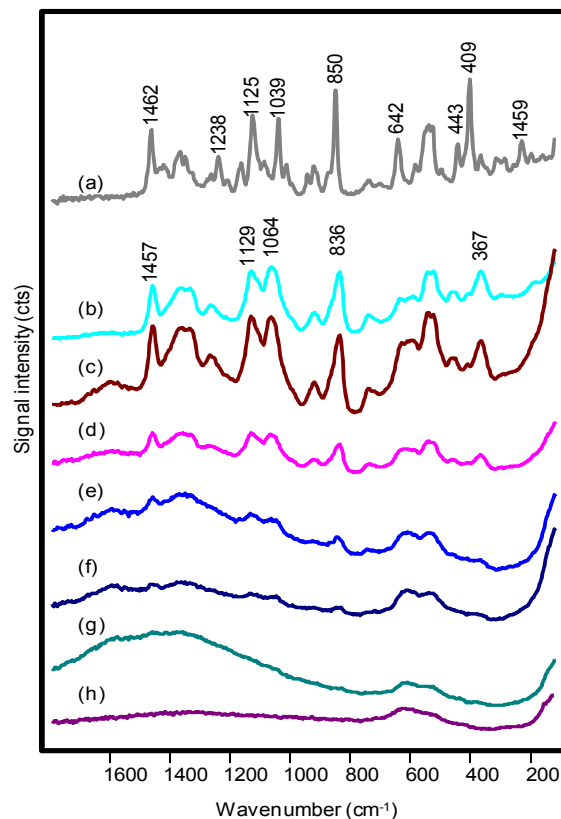

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Bands (cm^{-1})	Sugar	Peak Assignments
420	Glucose	Deformation C-C-O and C-C-C
520	Sucrose	Deformation C-C-O and C-C-C
835-838	Sucrose	Associated with fructose, CH out of plane deformation
916-920	Glucose	Deformation C-H, C-O-H
1060	Both Sugars	Stretching C-O
1126	Glucose	Deformation C-O-H
1365	Both sugars	Asymmetric deformation in the plane of CH$_2$
1456	Both sugars	Symmetric deformation in the plane of CH$_2$

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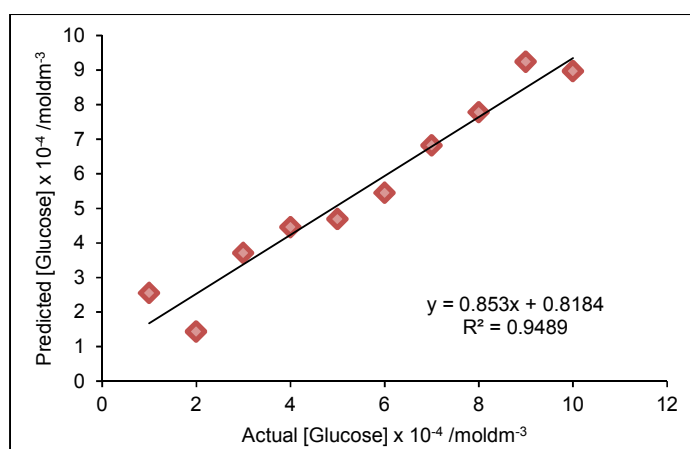

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References

1. Pierna, J. A. F.; Abbas, O.; Dardenne, P.; Baeten, V. *Biotechnology, Agronomy, Society and Environment*, **2011**, 15, 75-84.