SUPPORTING INFORMATION

Characterisation of the cell surface and cell wall chemistry of drinking water bacteria by combining XPS and FTIR spectroscopy, modelling and potentiometric titrations

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Atomic Force Spectroscopy images to calculate bacterial dimensions

Atomic Force Microscopy (AFM) images of *A. commune* were made using a Dimension 3100 (Digital Instrument) in tapping mode and using a silicon tip. The images were processed using the Dimension 3100 software "Nanoscope".

Bacterial surface area was calculated according to Fein et al. [1], since traditional solid surface area techniques cannot be used for microbial species, as untreated bacterial cells will not remain intact when placed under vacuum conditions. Therefore, the specific surface area was estimated using a geometric approach by measuring the external bacterium dimensions using atomic force microscopy (AFM). Figure S 1 shows that A. commune is rod shaped and the average long axe is 2.92μm and the short axe is 1.21μm. Based on these observations, the optical density measurements and the cell number per unit dry weight, a surface area of $80 m^2/g$ was calculated.

Titration of biomass at different ionic strength:

Figure S 2 compares the results from titrations with different ionic strength conditions. Although a possible ionic strength effect can be observed over the range studied, these effects are weak compared to the relatively large experimental uncertainties associated with biomass titrations [1,2,3,4,5,6]. The data shows an intersection point around pH 3.6-3.7, where there is no effect of the salt concentration. This value is similar to the pH of zero proton charge (pH_{zpc}) calculated by PROTOFIT using the surface complexion model.

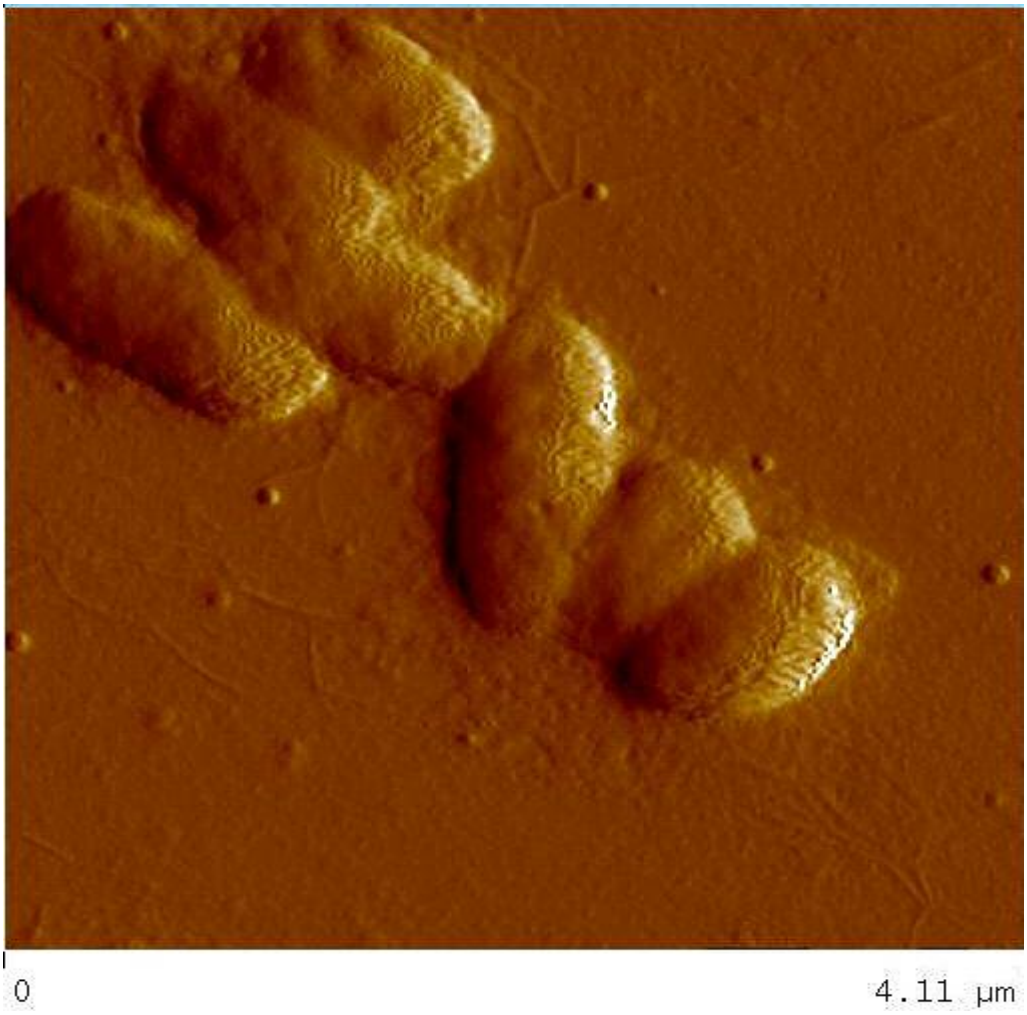

Figure S 1: AFM image of *Aquabacterium commune*.

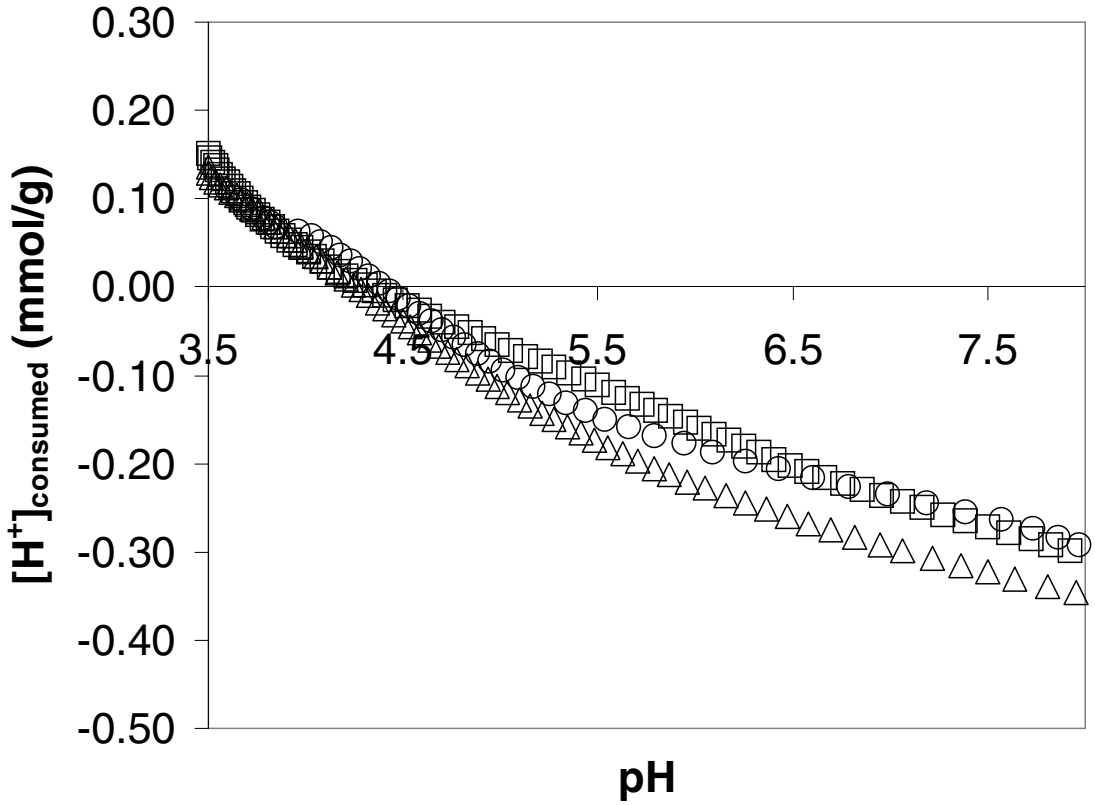

Figure S 2: Potentiometric titration data for suspensions of 4.0g/L (dry weight) of *Aquabacterium commune* in 0.01 (squares), 0.1 (circles) and 1.0 (triangles) M $NaClO_4$.

Literature Cited

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