Supplementary information for "A general approach to maximise information density in neutron reflectometry analysis"

Andrew R. McCluskey,[1,2,*] Joshaniel F. K. Cooper,[3] Tom Arnold,[4,2,3] and Tim Snow[1,5]

[1]*Diamond Light Source, Rutherford Appleton Laboratory,*
Harwell Science and Innovation Campus, Didcot, OX11 0DE, UK
[2]*Department of Chemistry, University of Bath, Claverton Down, Bath BA2 7AY, UK*
[3]*ISIS Pulsed Neutron and Muon Source, Science and Technology Facilities Council,*
Rutherford Appleton Laboratory, Harwell Science and Innovation Campus, Didcot, Oxfordshire, OX11 0QX, UK
[4]*European Spallation Source, SE-211 00 Lund, Sweden*
[5]*School of Chemistry, University of Bristol, Bristol, BS8 1TS, UK*
(Dated: March 5, 2020)

---

[*] andrew.mccluskey@diamond.ac.uk; a.r.mccluskey@bath.ac.uk

I. EVIDENCE

The Bayesian $\ln\{p(\mathbf{D}|H)\}$ for each of the possible permutations of free parameters investigated in this work is given in Table S1.

TABLE S1. The values for evidence for each of the possible permutations of the 6 free parameters.

Free parameters	$p(\boldsymbol{D}|H)$	Free parameters	$p(\boldsymbol{D}|H)$
$d_h/V_h/d_t/V_t$	6872.1 ± 0.2	$d_h/d_t/V_t$	6866.8 ± 0.2
$d_h/V_h/d_t/V_t/\sigma$	6866.4 ± 0.3	$d_h/V_h/d_t/\phi_t/V_t$	6864.7 ± 0.3
$d_h/d_t/V_t/\sigma$	6861.0 ± 0.3	$d_h/V_h/d_t/\phi_t/V_t/\sigma$	6859.9 ± 0.3
$d_h/d_t/\phi_t/V_t$	6859.2 ± 0.3	$d_h/d_t/\phi_t/V_t/\sigma$	6854.2 ± 0.3
d_h/d_t	6820.8 ± 0.2	$d_h/V_h/d_t$	6818.6 ± 0.2
$d_h/d_t/\sigma$	6814.2 ± 0.2	$d_h/d_t/\phi_t$	6813.4 ± 0.3
$d_h/V_h/d_t/\sigma$	6812.3 ± 0.3	$d_h/V_h/d_t/\phi_t$	6811.5 ± 0.3
$d_h/d_t/\phi_t/\sigma$	6806.9 ± 0.3	$d_h/V_h/d_t/\phi_t/\sigma$	6805.3 ± 0.3
$V_h/d_t/\phi_t$	6597.3 ± 0.2	$V_h/d_t/\phi_t/V_t$	6594.6 ± 0.3
$V_h/d_t/\phi_t/\sigma$	6591.7 ± 0.3	$d_t/\phi_t/V_t$	6589.9 ± 0.2
$V_h/d_t/\phi_t/V_t/\sigma$	6589.4 ± 0.3	$d_t/\phi_t/V_t/\sigma$	6584.4 ± 0.3
d_t/ϕ_t	6584.1 ± 0.2	$d_t/\phi_t/\sigma$	6578.5 ± 0.2
$V_h/d_t/V_t/\sigma$	6468.5 ± 0.2	$d_t/V_t/\sigma$	6463.7 ± 0.2
$V_h/d_t/\sigma$	6459.0 ± 0.2	d_t/σ	6435.8 ± 0.2
V_h/d_t	6424.3 ± 0.2	$V_h/d_t/V_t$	6423.4 ± 0.2
d_t	6414.9 ± 0.1	d_t/V_t	6411.3 ± 0.2
$d_h/V_h/\phi_t/V_t$	5839.3 ± 0.2	$d_h/V_h/\phi_t/V_t/\sigma$	5832.9 ± 0.3
$V_h/\phi_t/V_t$	5811.9 ± 0.2	$V_h/\phi_t/V_t/\sigma$	5804.9 ± 0.3
$d_h/\phi_t/V_t$	5657.1 ± 0.2	ϕ_t/V_t	5653.2 ± 0.2
$d_h/\phi_t/V_t/\sigma$	5650.2 ± 0.3	$\phi_t/V_t/\sigma$	5646.1 ± 0.3
$d_h/V_h/V_t$	5356.6 ± 0.2	$d_h/V_h/V_t/\sigma$	5350.0 ± 0.3
d_h/V_t	5254.3 ± 0.2	$d_h/V_t/\sigma$	5247.6 ± 0.2
V_h/V_t	5213.1 ± 0.2	$V_h/V_t/\sigma$	5207.7 ± 0.2
$d_h/V_h/\phi_t$	5092.9 ± 0.2	d_h/ϕ_t	5091.9 ± 0.2
$d_h/V_h/\phi_t/\sigma$	5087.4 ± 0.3	$d_h/\phi_t/\sigma$	5086.3 ± 0.2
V_h/ϕ_t	4998.3 ± 0.2	ϕ_t	4996.3 ± 0.1
$V_h/\phi_t/\sigma$	4992.4 ± 0.2	ϕ_t/σ	4990.6 ± 0.2
V_t	4956.7 ± 0.1	V_t/σ	4951.3 ± 0.2
$d_h/V_h/\sigma$	3513.5 ± 0.3	d_h/σ	3060.1 ± 0.1
V_h/σ	2672.8 ± 0.2	σ	2661.0 ± 0.1
d_h/V_h	2311.7 ± 0.2	d_h	2303.0 ± 0.1
V_h	-928.2 ± 0.1		

II. ADDITIONAL SUPPLEMENTARY INFORMATION