

Supporting information available.

Change in thickness and refractive index measurements of films of Compounds B (2.82% sulfur) and B' (6.67% sulfur) films after immersion in 50 ppm ionic solutions				
50 ppm solutions	Δ thickness ^{a,b,c} (nm)		Δ refractive index ^{a,b,c}	
	Compound B	Compound B'	Compound B	Compound B'
H ₂ O	-6.5 ± 0.6	-6.1 ± 0.4	-0.024 ± 0.002	-0.007 ± 0.001
CdCl ₂	-3.8 ± 0.5	-7.9 ± 0.3	-0.025 ± 0.000	-0.005 ± 0.002
Co(CH ₃ CO ₂) ₂	-9.2 ± 0.6 *	-18.2 ± 0.1 *	-0.030 ± 0.003	-0.016 ± 0.005
Pb(CH ₃ CO ₂) ₂	-1.8 ± 0.9	-11.5 ± 0.3 *	-0.022 ± 0.002	-0.015 ± 0.002
PbN ₂ O ₆	-5.6 ± 0.3	-8.7 ± 0.5	-0.023 ± 0.002	-0.007 ± 0.001
HgN ₂ O ₆	4.6 ± 0.6 *	9.7 ± 1.6 *	0.000 ± 0.001 *	0.029 ± 0.001 *
NiSO ₄	0.1 ± 1.2 *	-6.2 ± 0.5	-0.032 ± 0.002 *	-0.022 ± 0.000 *
As ₄ O ₆	-4.5 ± 0.1	-6.8 ± 0.6	-0.024 ± 0.000	-0.005 ± 0.001 *
CrCl ₃	1.9 ± 0.3 *	-1.8 ± 1.1 *	-0.011 ± 0.001 *	-0.010 ± 0.006
Cr(NO ₃) ₃	1.3 ± 0.6 *	-3.6 ± 1.0	-0.015 ± 0.002	-0.009 ± 0.001
Na ₂ HPO ₄	-10.8 ± 0.7	-19.5 ± 0.7 *	-0.030 ± 0.004	-0.018 ± 0.003 *
CrO ₃	3.6 ± 0.3 *	-2.8 ± 0.6 *	0.002 ± 0.000 *	0.023 ± 0.001 *
CH ₃ COONa	-9.2 ± 0.9	-15.2 ± 0.5 *	-0.030 ± 0.002 *	-0.017 ± 0.002
NaCl	-0.8 ± 0.9	-7.7 ± 0.2	-0.011 ± 0.008	-0.008 ± 0.002
NaNO ₃	-0.2 ± 1.0	-6.5 ± 0.3	-0.015 ± 0.001 *	-0.007 ± 0.001
Na ₂ SO ₄	0.3 ± 0.5 *	-4.5 ± 3.2 *	-0.018 ± 0.003	-0.007 ± 0.004

^a Values in **bold type** denote statistically significant changes between the two samples sets (2.82% S and 6.67% S) for the same 50 ppm analyte solution, as determined by *t*-tests (95% confidence interval).

^b Values followed by an asterisk (*) are statistically significant changes between films exposed to 50 ppm ionic solution and films of the same sample set exposed to pure water, as determined by *t*-tests (95% confidence interval).

^c Thickness and refractive index data measured using the ellipsometer. Error is reported as the standard error of the mean from three independent replicate measurements.

Changes in thickness measurements after immersion of all film systems in 50 ppm ionic solutions

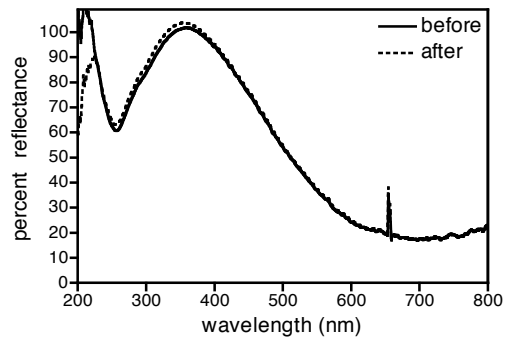
50 ppm solutions	Δ thickness (nm)					
	chitosan	Compound A	Compound B	Compound B'	Compound C	Compound D
H ₂ O	-1.4 ± 1.3	-13.0 ± 0.4	-6.5 ± 0.6	-6.1 ± 0.4	-11.1 ± 0.1	-1.5 ± 0.5
CdCl ₂	-0.0 ± 0.8	-9.8 ± 0.4	-3.8 ± 0.5	-7.9 ± 0.3	-13.3 ± 1.3	-0.6 ± 0.9
Co(CH ₃ CO ₂) ₂	-3.5 ± 1.1	-10.3 ± 0.2	-9.2 ± 0.6	-18.2 ± 0.1	-14.1 ± 0.8	-4.9 ± 0.5
Pb(CH ₃ CO ₂) ₂	-3.6 ± 1.1	-10.4 ± 0.2	-1.9 ± 0.9	-11.5 ± 0.3	-14.2 ± 0.6	-3.6 ± 1.2
Pb(NO ₃) ₂	-0.2 ± 1.0	-10.9 ± 0.2	-5.6 ± 0.3	-8.7 ± 0.5	-12.0 ± 0.6	-3.5 ± 0.2
Hg(NO ₃) ₂	22.5 ± 2.4	-1.6 ± 0.5	4.6 ± 0.6	9.7 ± 1.6	-1.2 ± 0.2	10.1 ± 0.5
NiSO ₄	-6.4 ± 0.5	0.8 ± 1.2	0.2 ± 1.2	-6.2 ± 0.5	-7.1 ± 0.9	-5.4 ± 1.5
As ₄ O ₆	-2.6 ± 0.5	-0.6 ± 0.6	-4.5 ± 0.1	-6.8 ± 0.6	-8.2 ± 0.8	-2.9 ± 0.5
CrCl ₃	9.4 ± 0.6	-7.9 ± 1.3	1.9 ± 0.3	-1.8 ± 1.1	-5.4 ± 0.8	0.6 ± 1.0
Cr(NO ₃) ₃	12.6 ± 2.2	0.5 ± 0.4	1.3 ± 0.6	-3.6 ± 1.0	-3.9 ± 0.5	2.8 ± 0.4
Na ₂ HPO ₄	-4.6 ± 0.9	-13.3 ± 0.7	-10.8 ± 0.7	-19.5 ± 0.7	-11.0 ± 0.6	-7.4 ± 0.9
CrO ₃	17.2 ± 0.7	3.4 ± 0.8	3.6 ± 0.3	-2.8 ± 0.6	-2.5 ± 0.7	4.6 ± 0.2
CH ₃ COONa	-4.9 ± 2.4	-11.0 ± 0.5	-9.2 ± 0.9	-15.2 ± 0.5	-14.3 ± 1.7	-4.8 ± 0.6
NaCl	-4.0 ± 1.5	-7.9 ± 0.9	-0.8 ± 1.9	-7.7 ± 0.2	-12.3 ± 0.7	-2.4 ± 0.5
NaNO ₃	-3.1 ± 1.6	-3.3 ± 0.3	-0.2 ± 1.0	-6.5 ± 0.3	-11.0 ± 0.9	-3.6 ± 0.5
Na ₂ SO ₄	-6.5 ± 1.2	-5.6 ± 0.2	0.3 ± 0.5	-4.5 ± 3.2	-8.7 ± 0.5	-3.3 ± 0.9

Changes in refractive index measurements after immersion of all film systems in 50 ppm ionic solutions

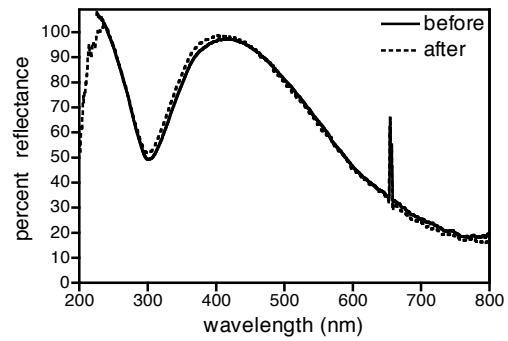
50 ppm solutions	Δ refractive index (at 589.3 nm)					
	chitosan	Compound A	Compound B	Compound B'	Compound C	Compound D
H ₂ O	-0.004 ± 0.003	-0.006 ± 0.001	-0.024 ± 0.002	-0.007 ± 0.001	-0.006 ± 0.003	-0.007 ± 0.001
CdCl ₂	-0.002 ± 0.001	-0.006 ± 0.002	-0.025 ± 0.000	-0.005 ± 0.002	0.001 ± 0.002	-0.010 ± 0.003
Co(CH ₃ CO ₂) ₂	-0.001 ± 0.001	-0.010 ± 0.001	-0.030 ± 0.003	-0.016 ± 0.005	-0.003 ± 0.003	-0.006 ± 0.002
Pb(CH ₃ CO ₂) ₂	-0.002 ± 0.004	-0.012 ± 0.001	-0.022 ± 0.002	-0.015 ± 0.002	-0.002 ± 0.002	-0.003 ± 0.001
Pb(NO ₃) ₂	-0.002 ± 0.001	-0.008 ± 0.003	-0.023 ± 0.002	-0.007 ± 0.001	-0.002 ± 0.001	-0.005 ± 0.001
Hg(NO ₃) ₂	0.017 ± 0.000	0.021 ± 0.005	0.000 ± 0.001	0.029 ± 0.001	0.025 ± 0.001	0.014 ± 0.001
NiSO ₄	0.013 ± 0.003	-0.010 ± 0.001	-0.032 ± 0.002	-0.022 ± 0.000	-0.005 ± 0.001	0.015 ± 0.003
As ₄ O ₆	-0.010 ± 0.005	0.005 ± 0.001	-0.024 ± 0.000	-0.005 ± 0.001	0.000 ± 0.000	-0.006 ± 0.002
CrCl ₃	0.001 ± 0.001	-0.004 ± 0.003	-0.011 ± 0.001	-0.010 ± 0.006	-0.001 ± 0.000	-0.001 ± 0.001
Cr(NO ₃) ₃	-0.005 ± 0.002	-0.009 ± 0.001	-0.015 ± 0.002	-0.009 ± 0.001	-0.003 ± 0.001	-0.006 ± 0.001
Na ₂ HPO ₄	-0.003 ± 0.001	-0.012 ± 0.002	-0.030 ± 0.004	-0.018 ± 0.003	-0.012 ± 0.001	-0.008 ± 0.002
CrO ₃	0.056 ± 0.002	0.076 ± 0.003	0.002 ± 0.000	0.023 ± 0.001	0.064 ± 0.002	-0.044 ± 0.000
CH ₃ COONa	0.005 ± 0.010	-0.012 ± 0.001	-0.030 ± 0.002	-0.017 ± 0.002	-0.007 ± 0.008	-0.009 ± 0.002
NaCl	-0.001 ± 0.001	-0.004 ± 0.003	-0.011 ± 0.008	-0.008 ± 0.002	-0.003 ± 0.002	-0.004 ± 0.002
NaNO ₃	-0.009 ± 0.007	0.002 ± 0.001	-0.015 ± 0.001	-0.007 ± 0.001	-0.005 ± 0.005	-0.005 ± 0.001
Na ₂ SO ₄	0.007 ± 0.005	-0.008 ± 0.000	-0.018 ± 0.003	-0.007 ± 0.004	-0.006 ± 0.001	-0.005 ± 0.001

chitosan

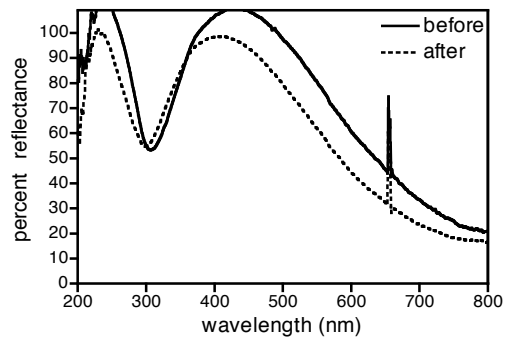
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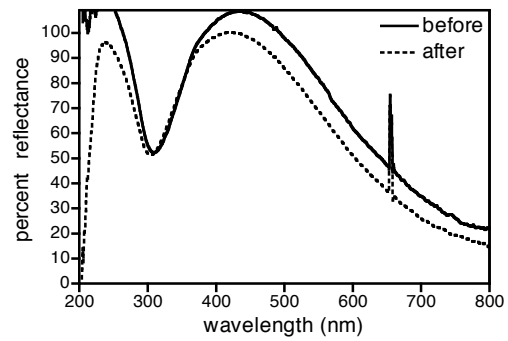
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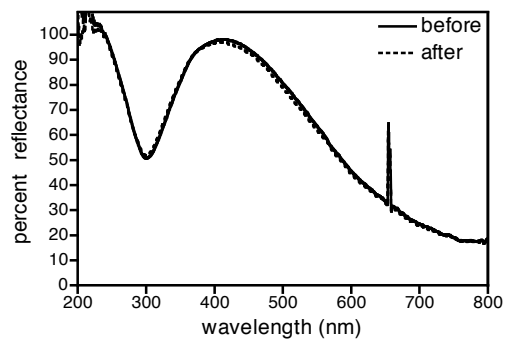
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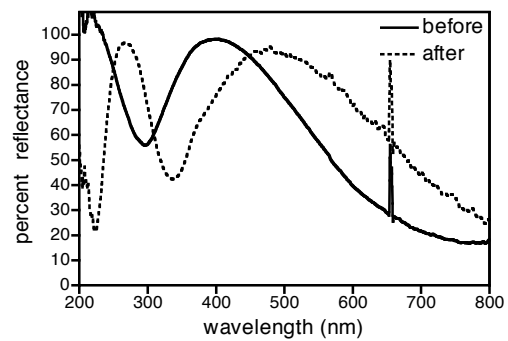
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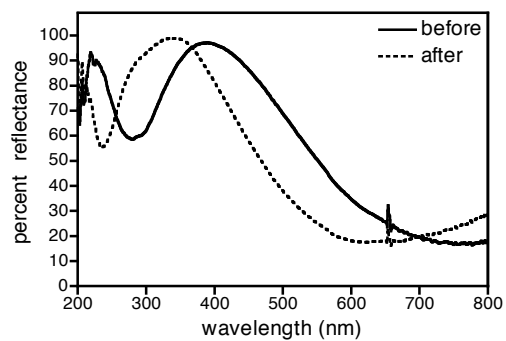
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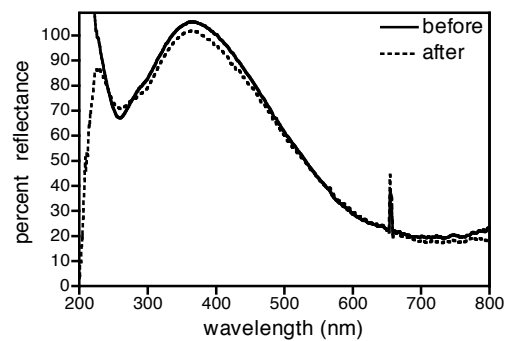
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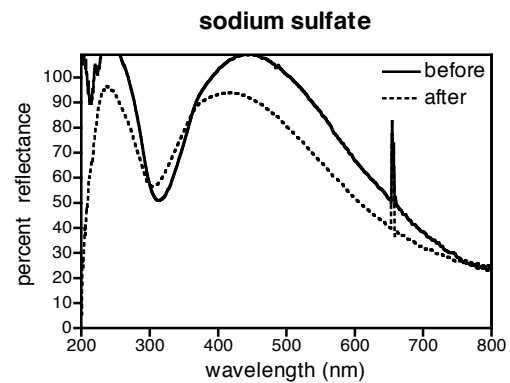
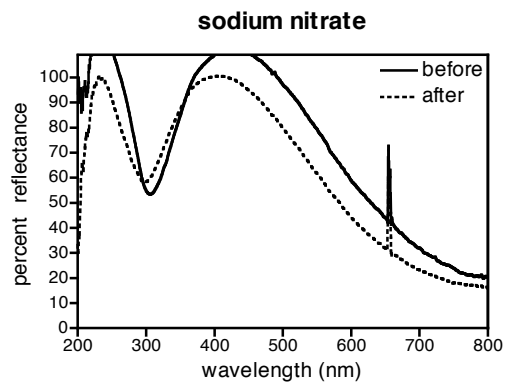
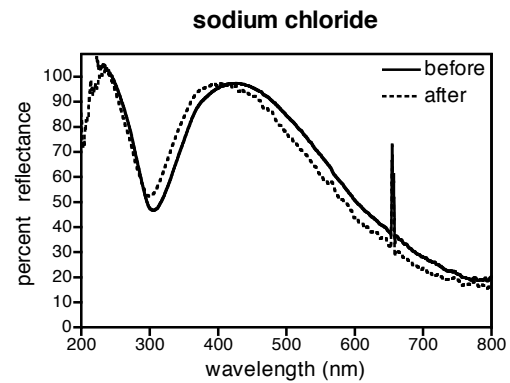
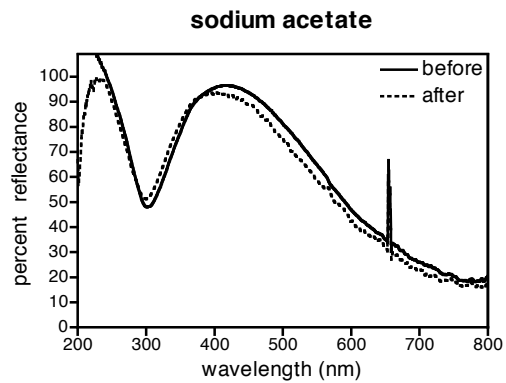
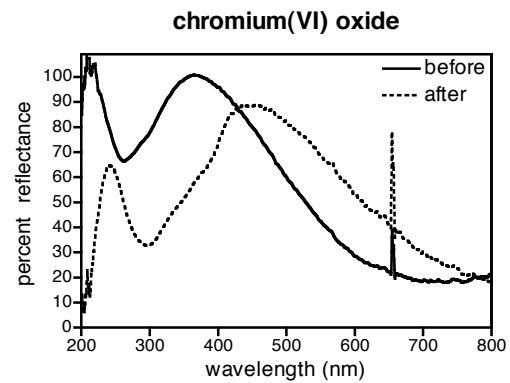
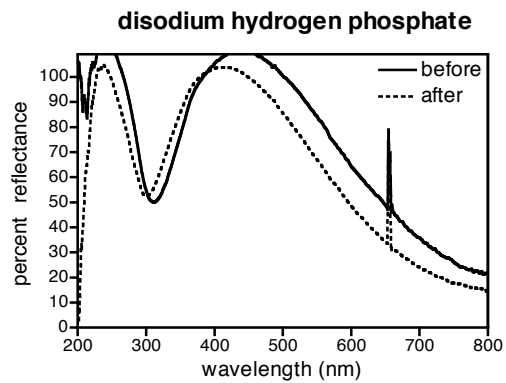
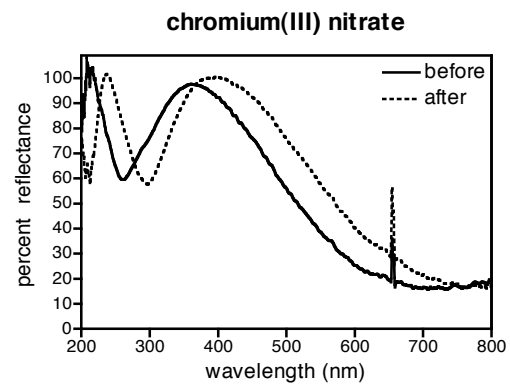
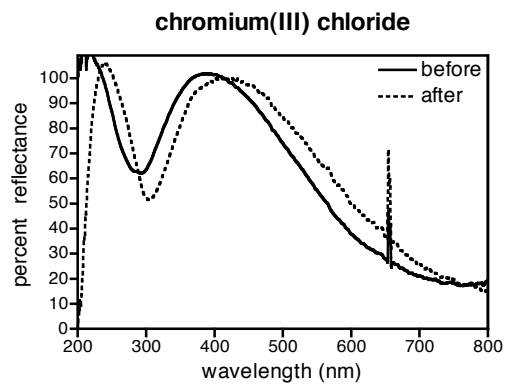
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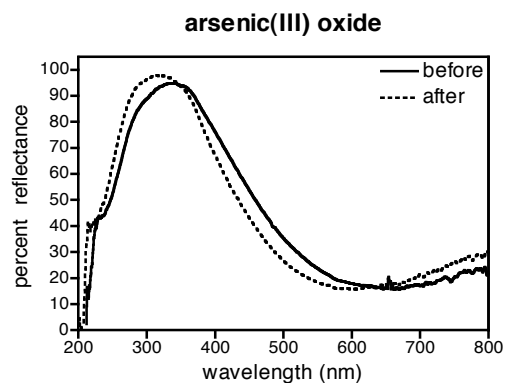
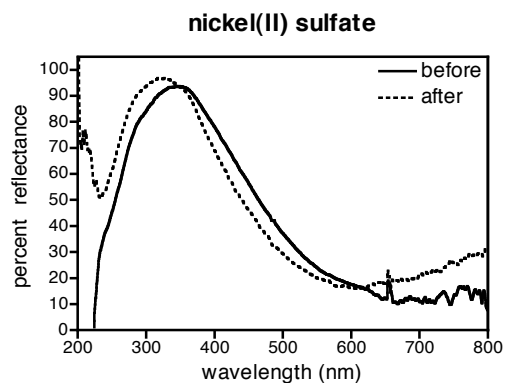
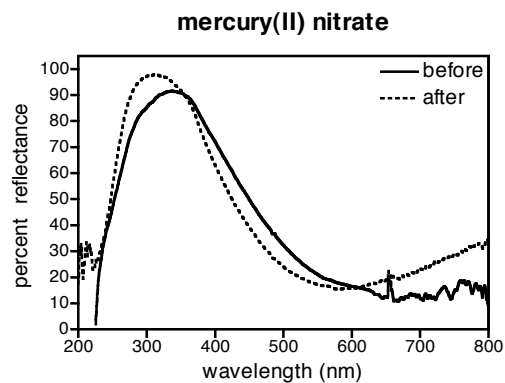
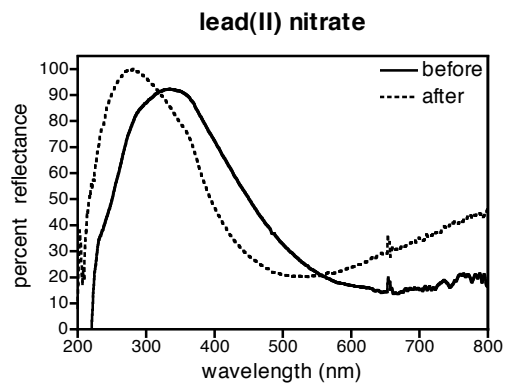
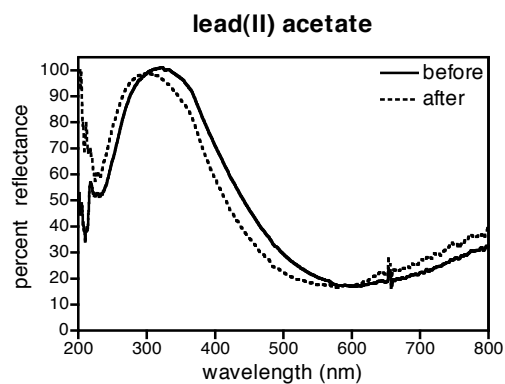
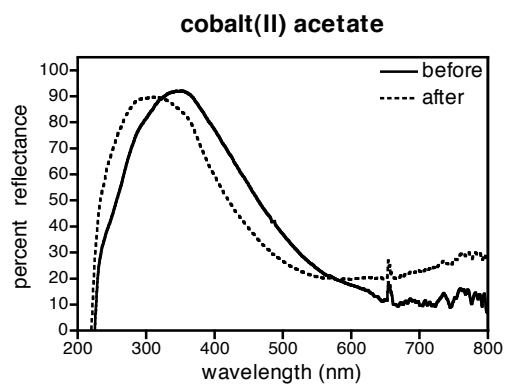
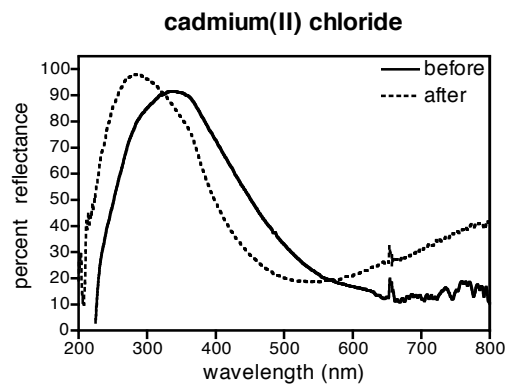
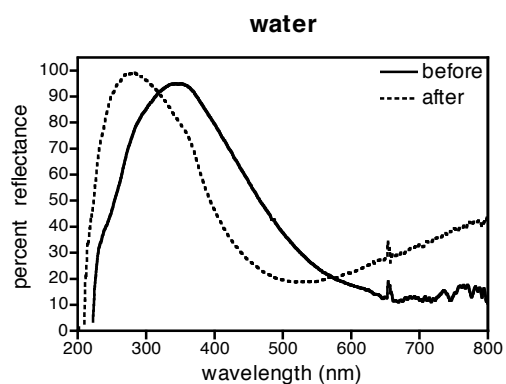
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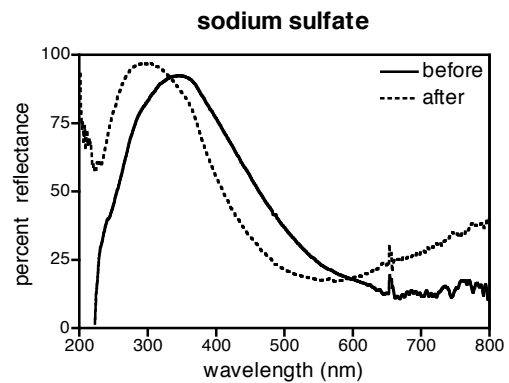
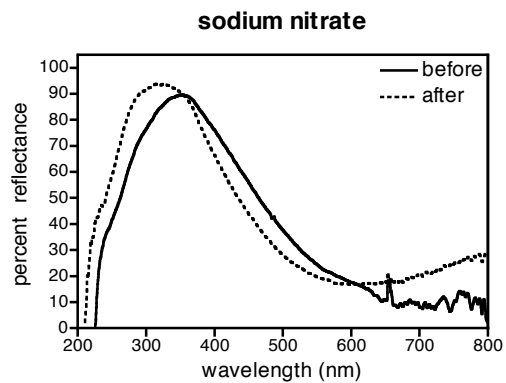
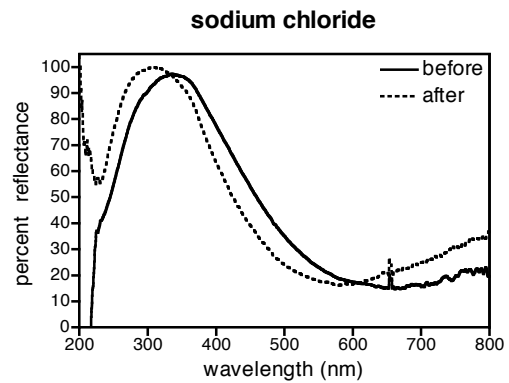
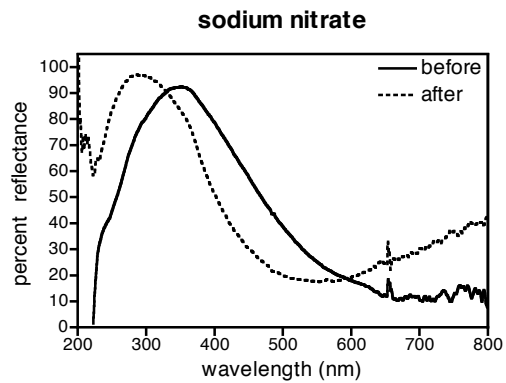
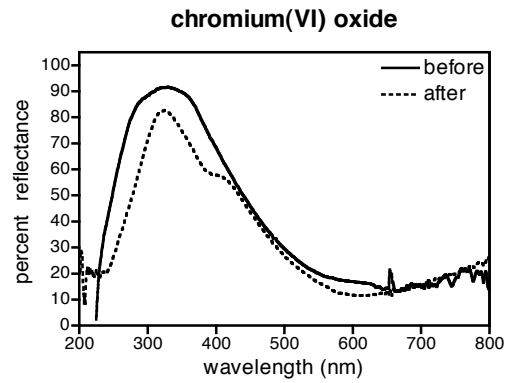
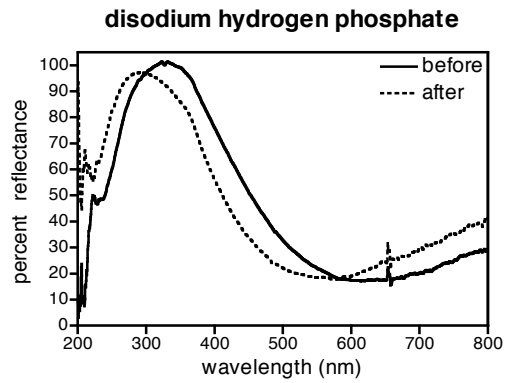
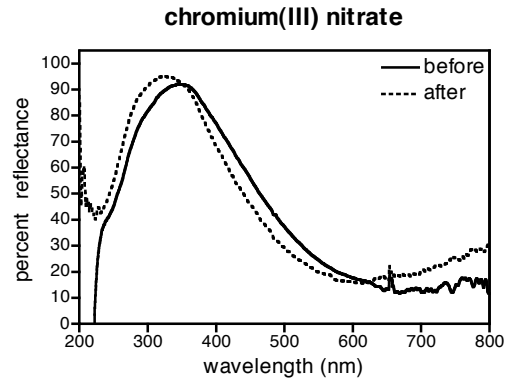
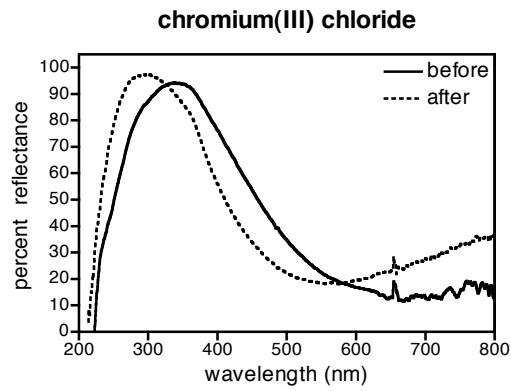
chitosan



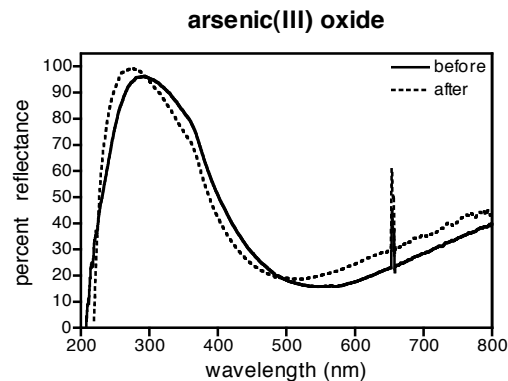
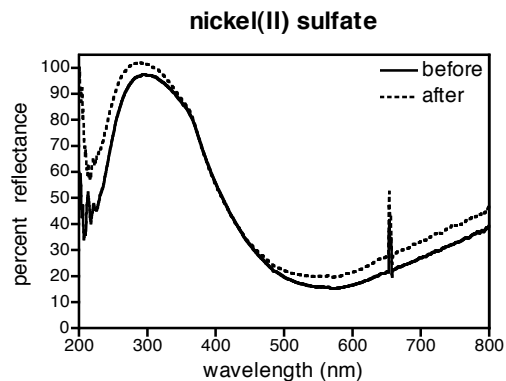
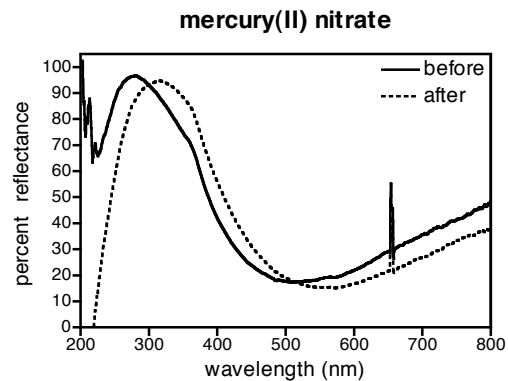
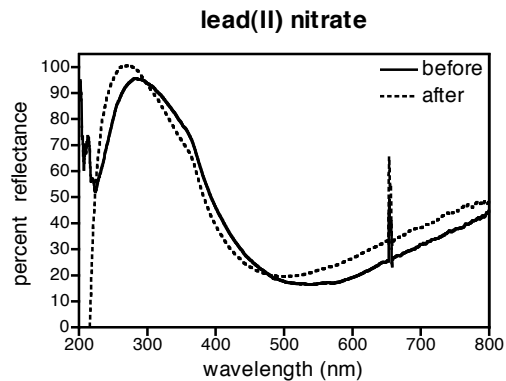
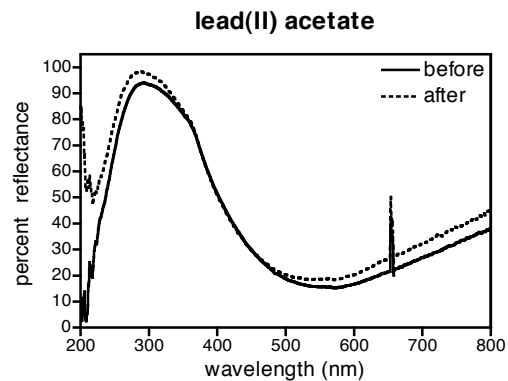
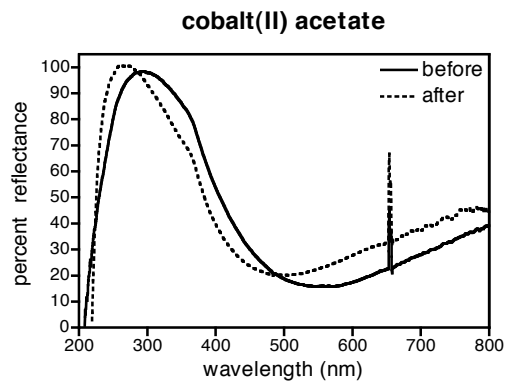
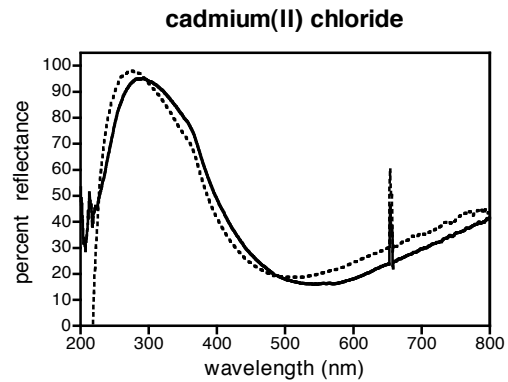
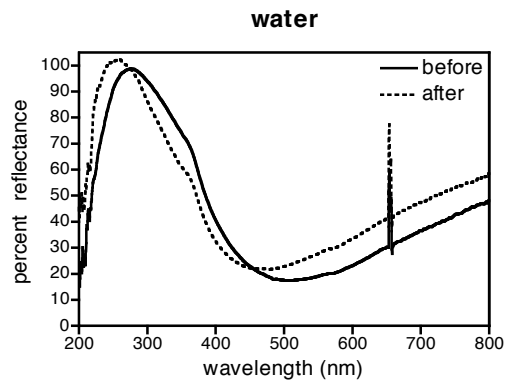
Compound A



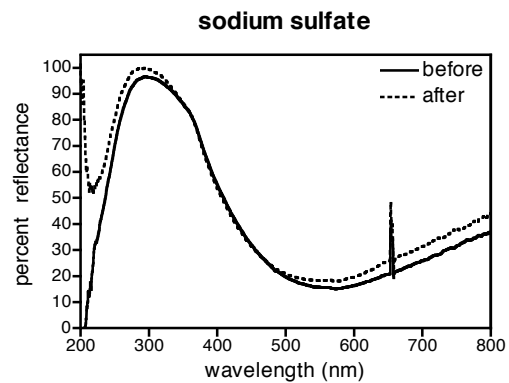
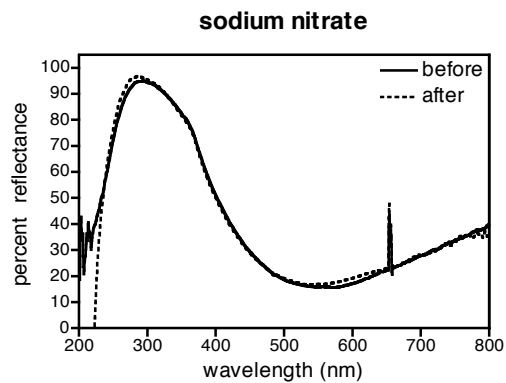
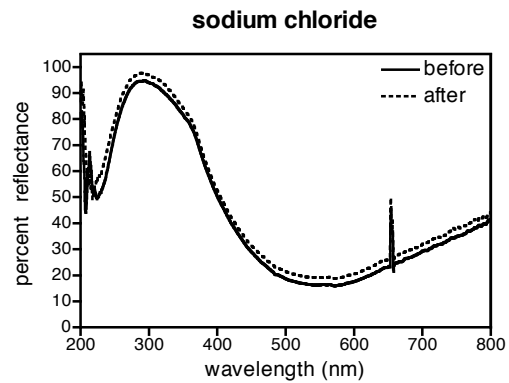
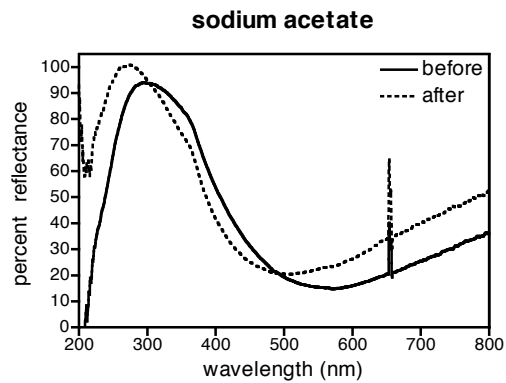
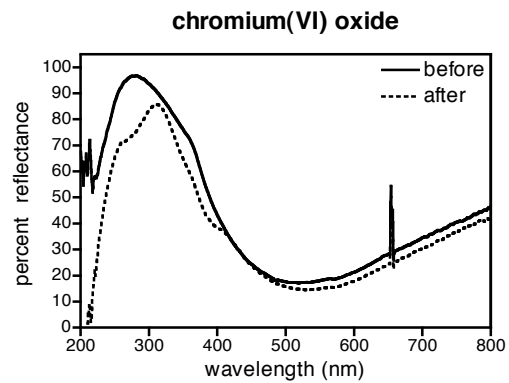
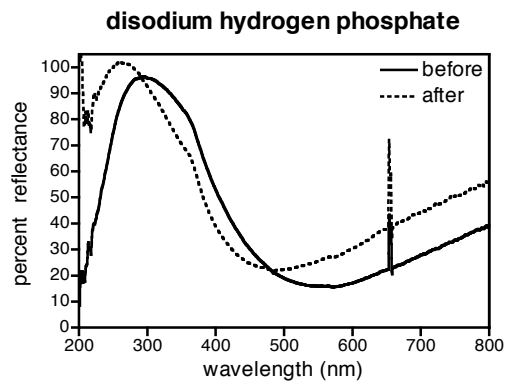
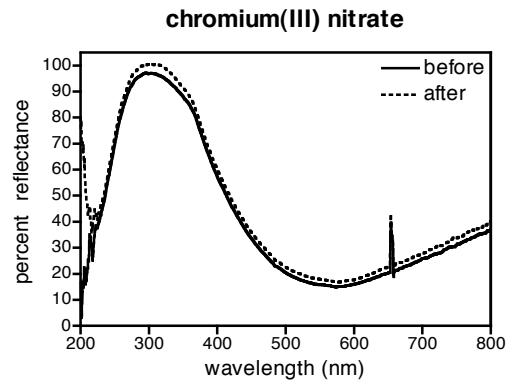
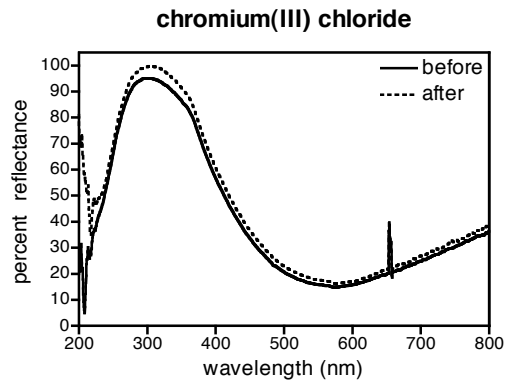
Compound A



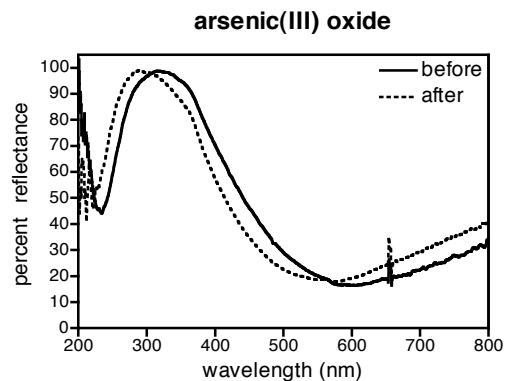
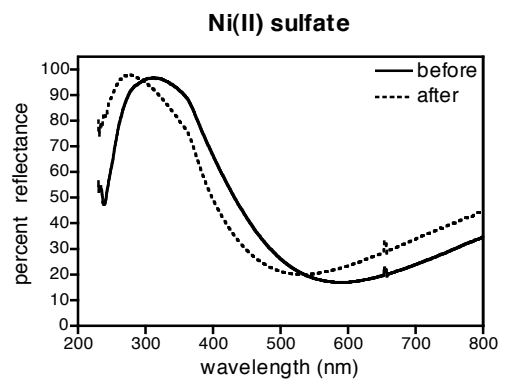
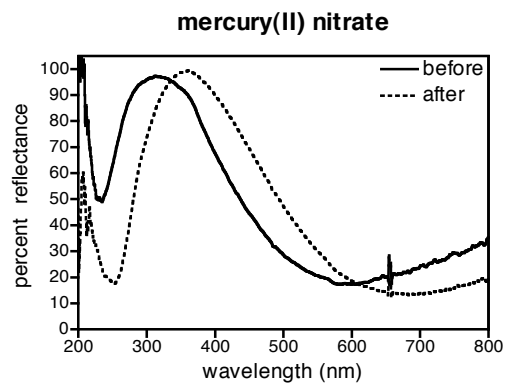
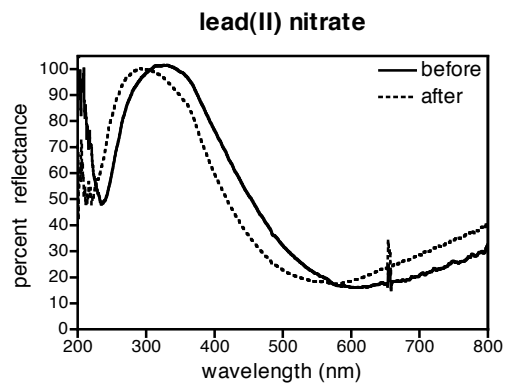
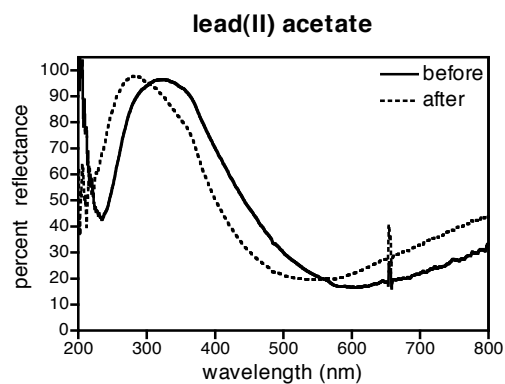
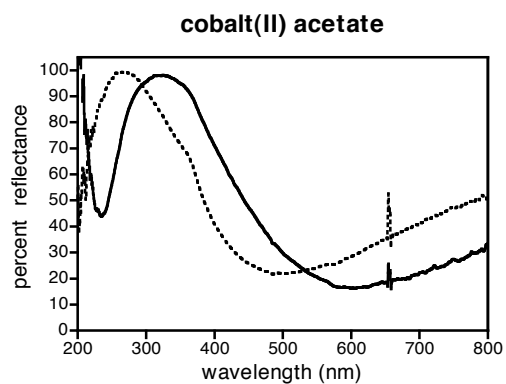
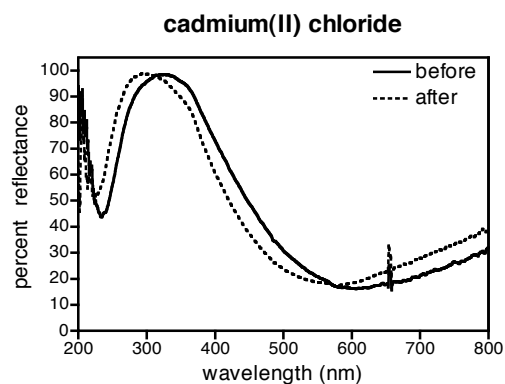
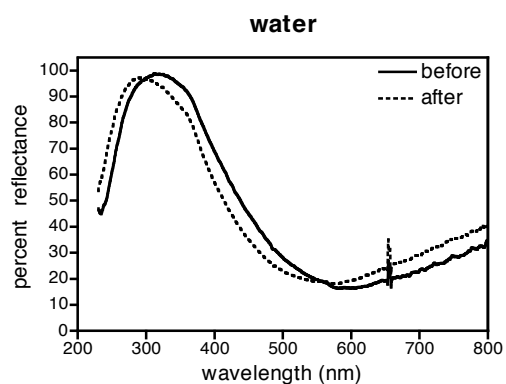
Compound B



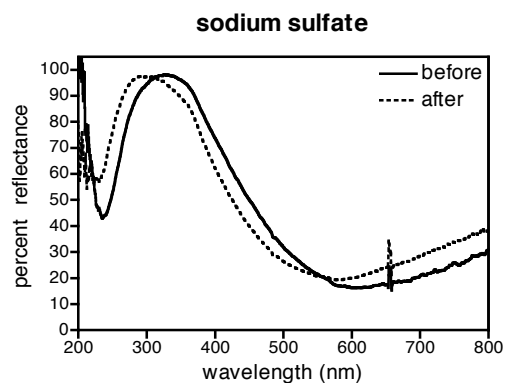
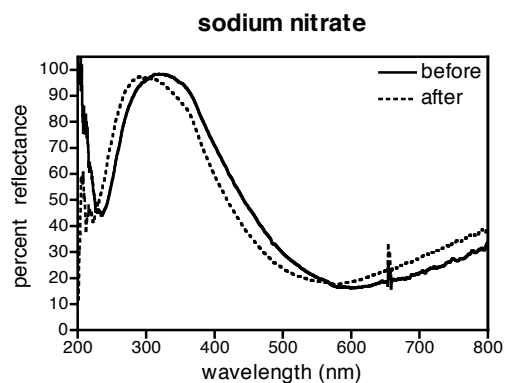
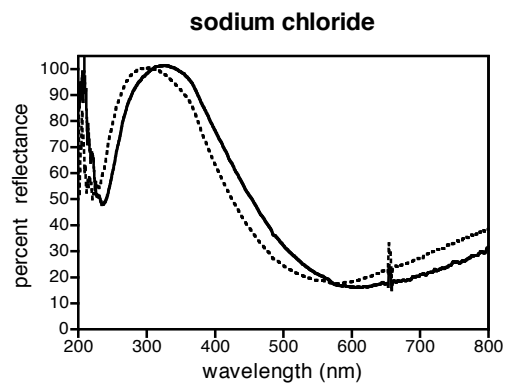
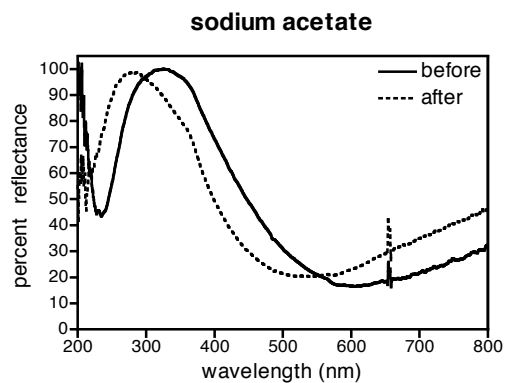
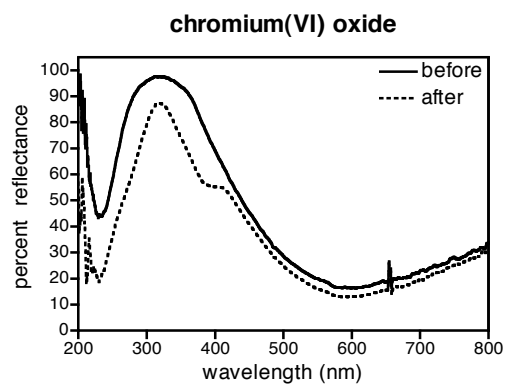
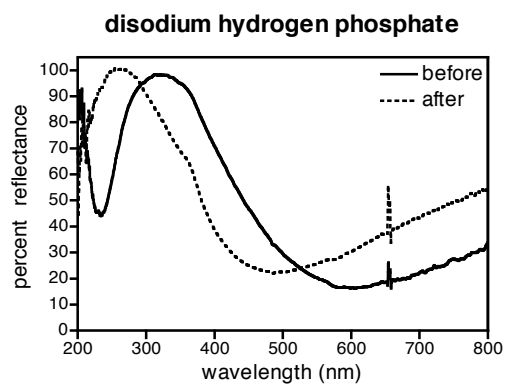
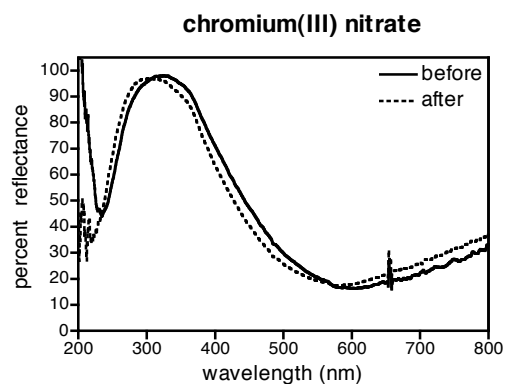
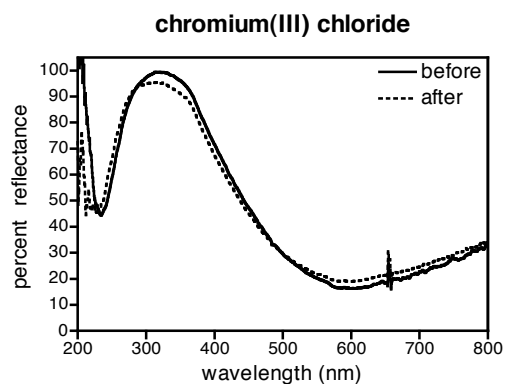
Compound B



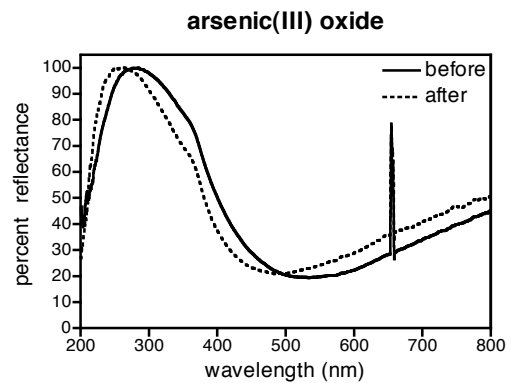
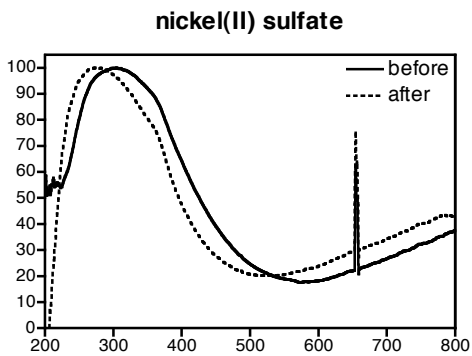
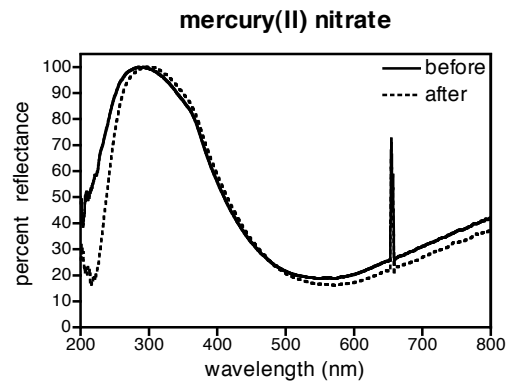
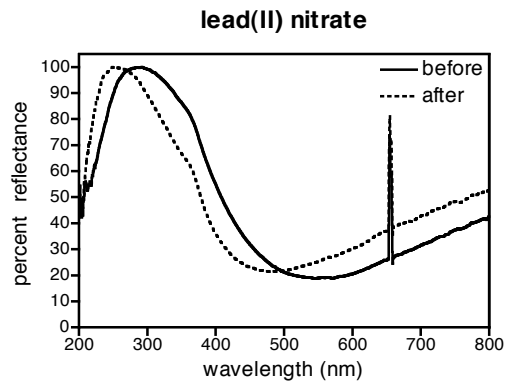
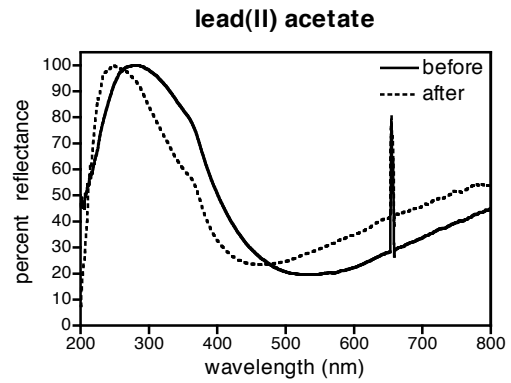
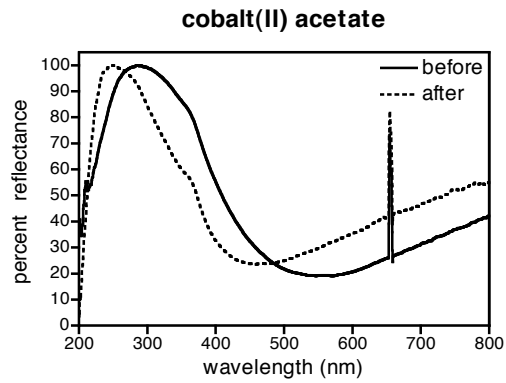
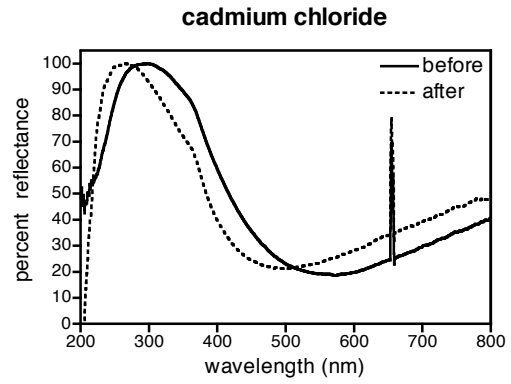
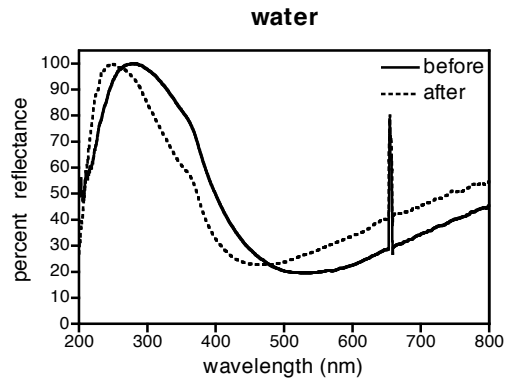
Compound B'



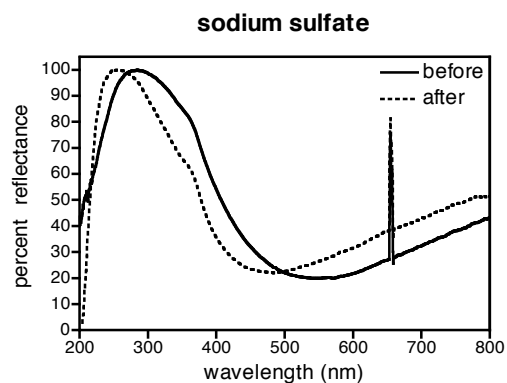
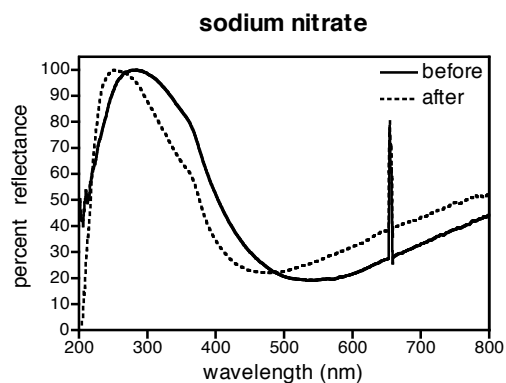
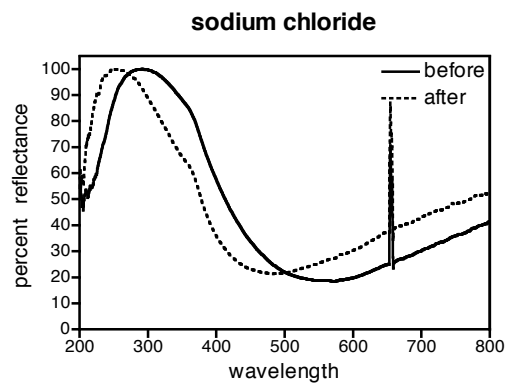
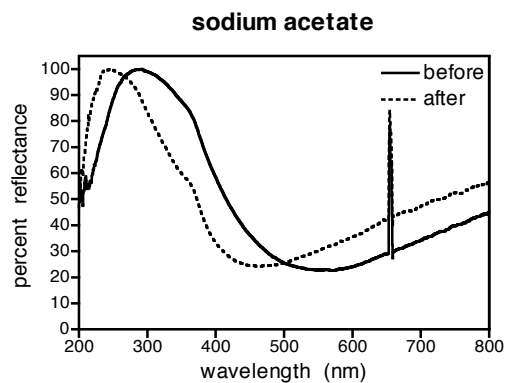
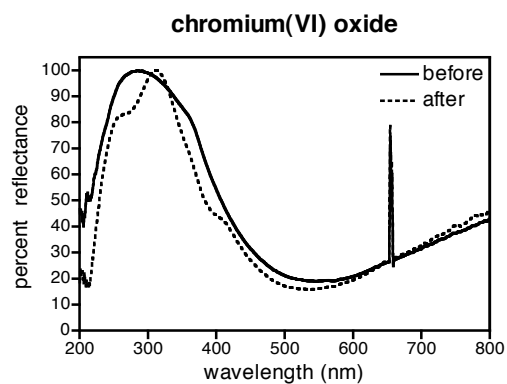
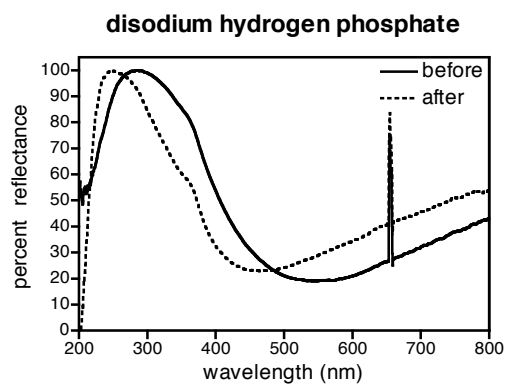
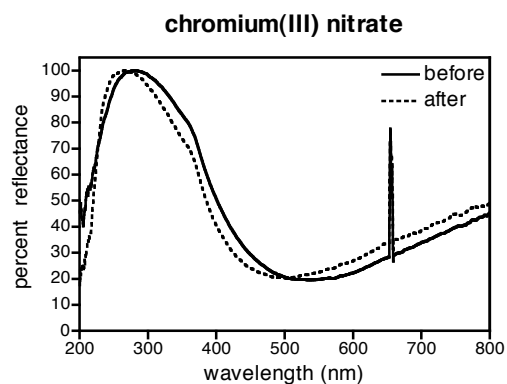
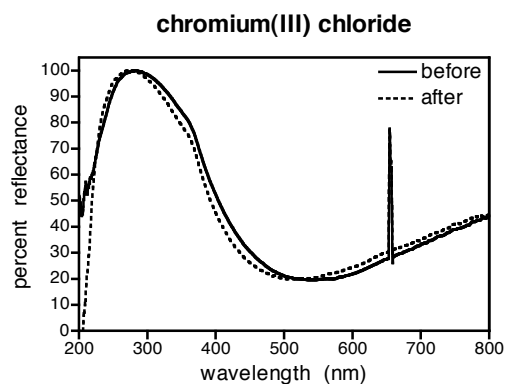
Compound B'



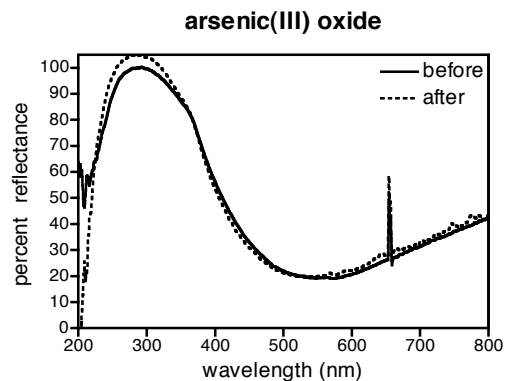
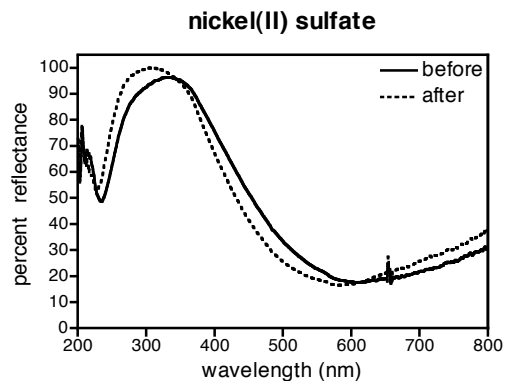
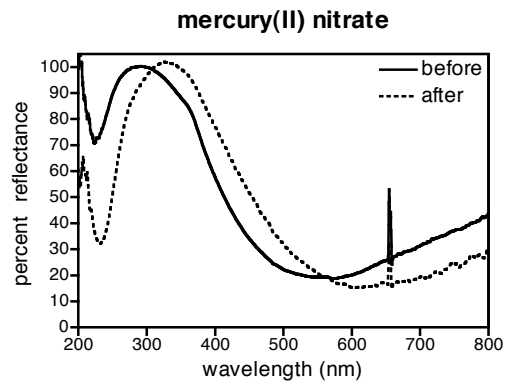
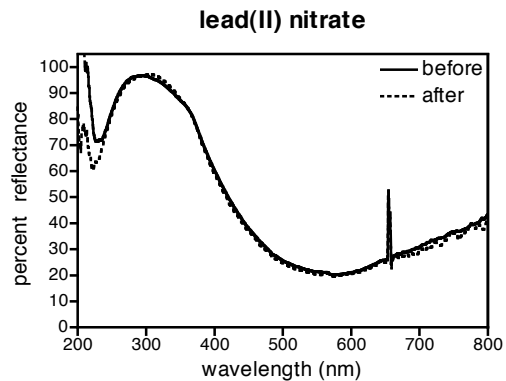
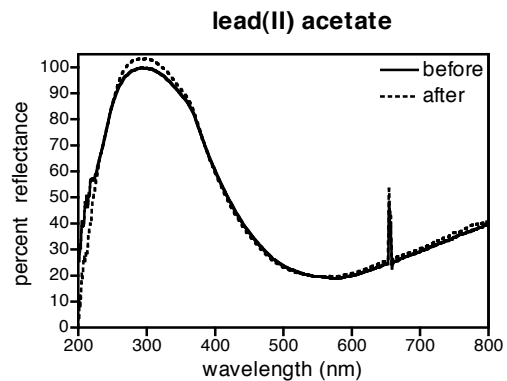
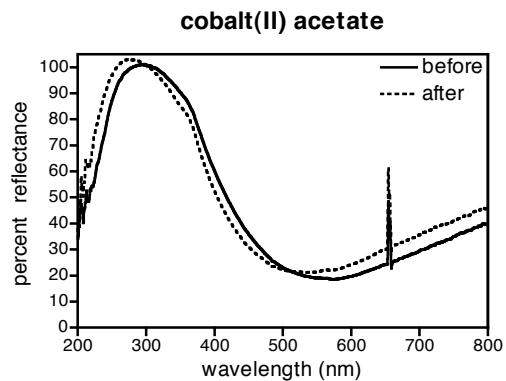
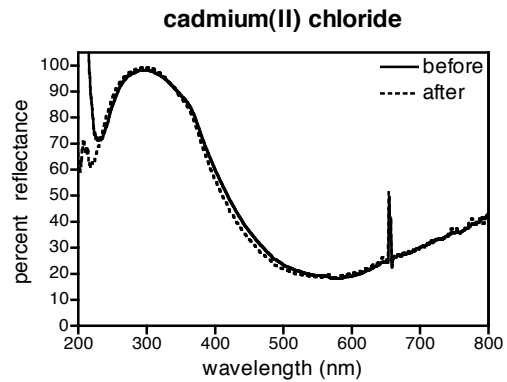
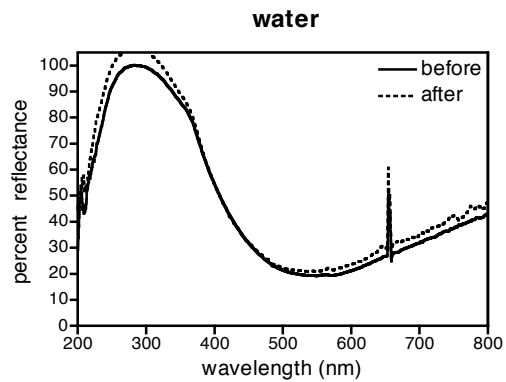
Compound C



Compound C



Compound D



Compound D

