

Appendix D

pH Titration and Constituent Leaching as a Function of pH (SR002 test results)

<u>Fly Ash Comparisons</u>	D-1
pH titration	D-2
Mercury	D-3
Aluminum	D-4
Antimony	D-5
Arsenic	D-6
Barium	D-7
Boron	D-8
Cadmium	D-9
Chromium	D-10
Cobalt	D-11
Lead	D-12
Molybdenum	D-13
Selenium	D-14
Thallium	D-15
<u>Gypsum Comparisons</u>	D-16
pH titration	D-17
Mercury	D-18
Aluminum	D-19
Antimony	D-20
Arsenic	D-21
Barium	D-22
Boron	D-23
Cadmium	D-24
Chromium	D-25
Cobalt	D-26
Lead	D-27
Molybdenum	D-28
Selenium	D-29
Thallium	D-30

<u>Scrubber Sludge Comparisons</u>	D-31
pH titration	D-32
Mercury	D-33
Aluminum	D-34
Antimony	D-35
Arsenic	D-36
Barium	D-37
Boron	D-38
Cadmium	D-39
Chromium	D-40
Cobalt	D-41
Lead	D-42
Molybdenum	D-43
Selenium	D-44
Thallium	D-45
<u>Fixated Stabilized Sludge Comparisons</u>	D-46
pH titration	D-47
Mercury	D-49
Aluminum	D-51
Antimony	D-53
Arsenic	D-55
Barium	D-57
Boron	D-59
Cadmium	D-61
Chromium	D-63
Cobalt	D-65
Lead	D-67
Molybdenum	D-69
Selenium	D-71
Thallium	D-73
<u>Table of Outliers</u>	D-75

Fly Ash Comparisons (FA)

Facility A

Coal: low sulfur bituminous
APC: NO+SNCR+FF

CFA
(SNCR Off)

AFA
(SNCR On)

Facility B

Coal: low sulfur bituminous
APC: NO+SCR+ESP(CS) [Mg lime]

DFA
(SCR Off)

BFA
(SCR On)

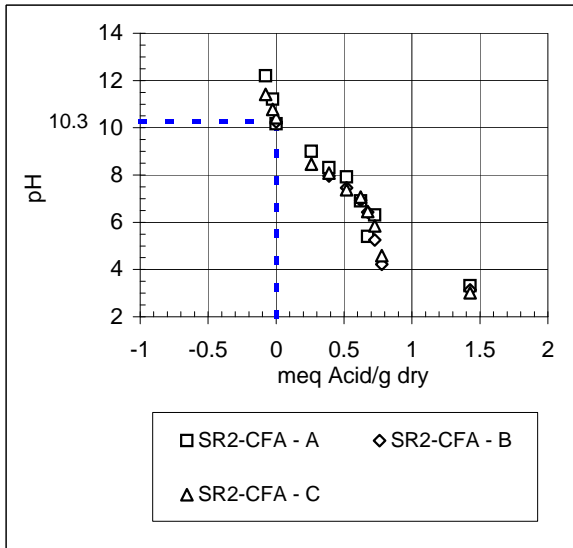
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Coal: sub- bituminous
APC: NO+SCR+ESP(CS) [Mg lime]

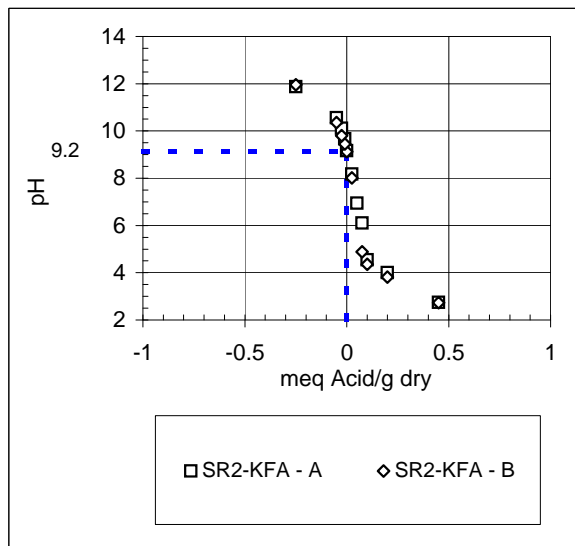
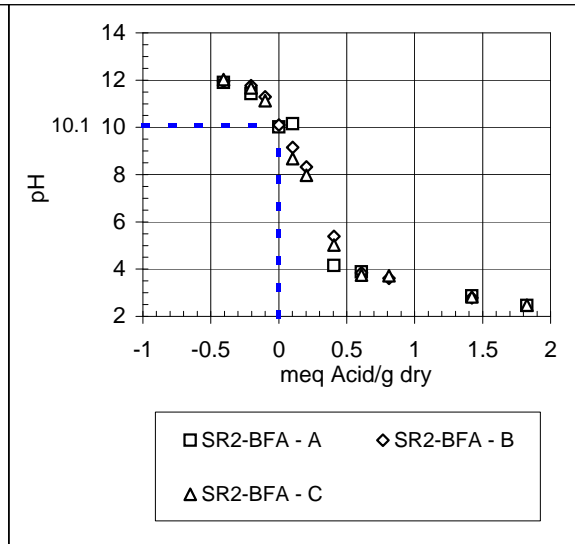
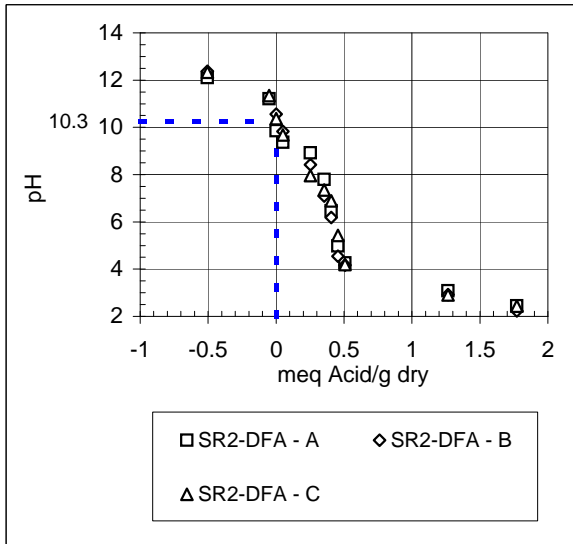
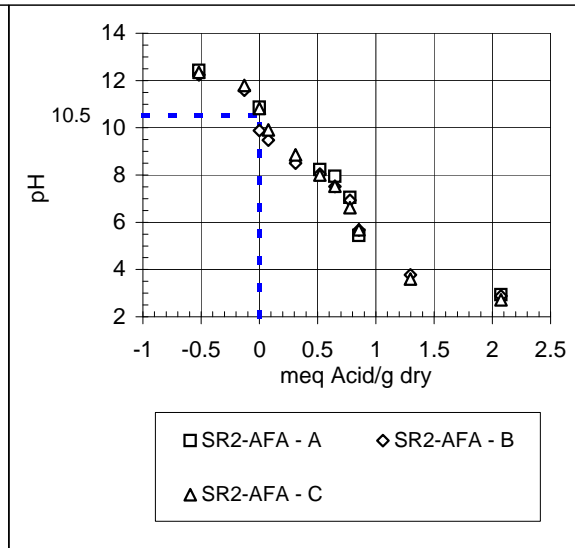
KFA
(SCR On)

Fly Ash Comparisons

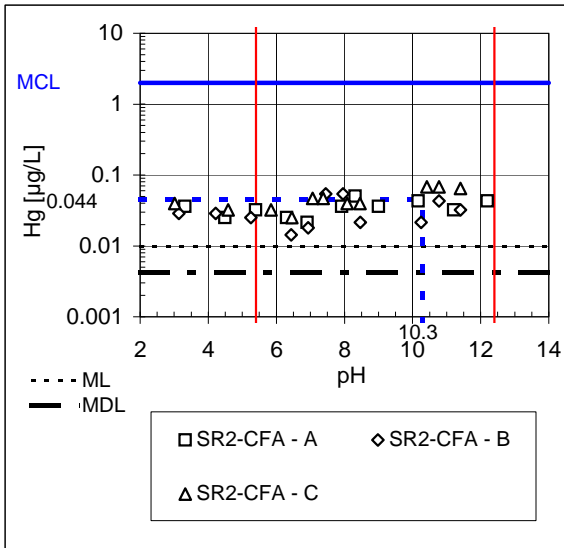
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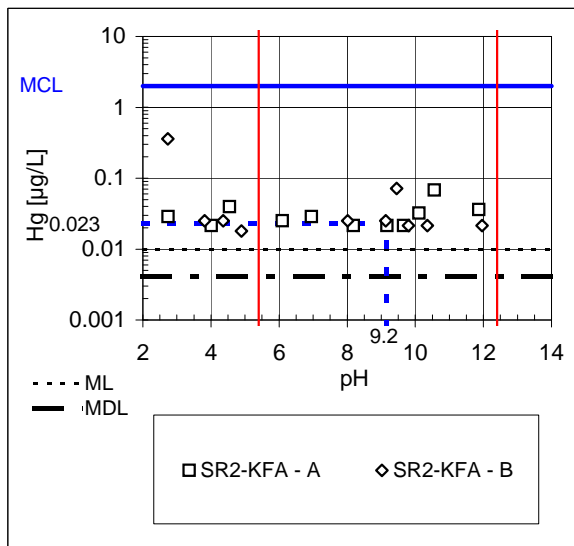
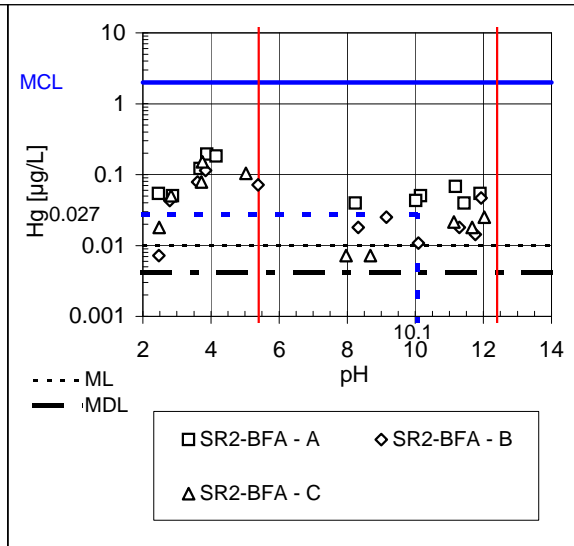
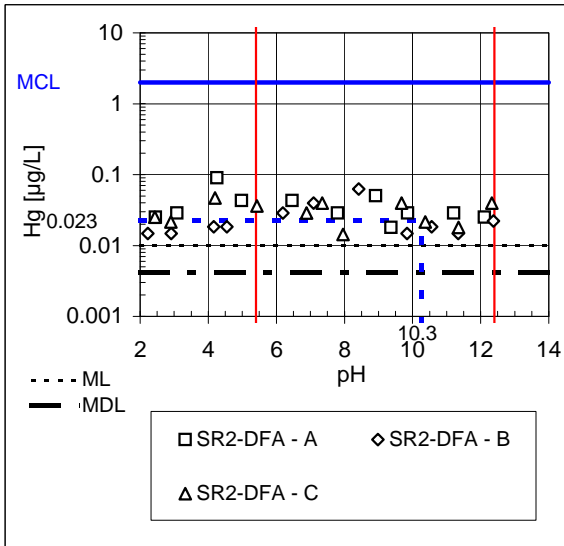
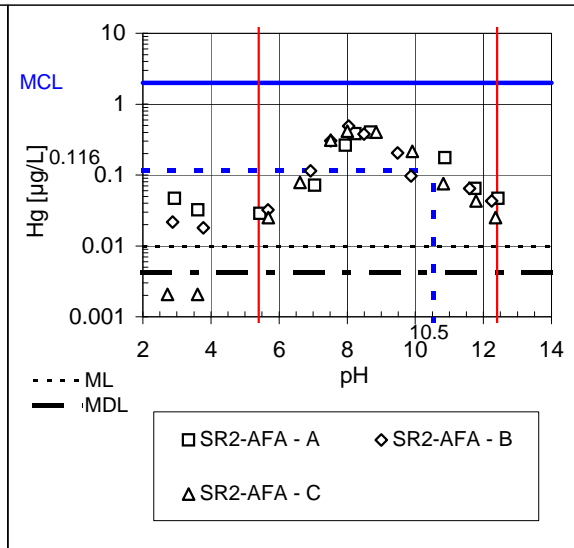
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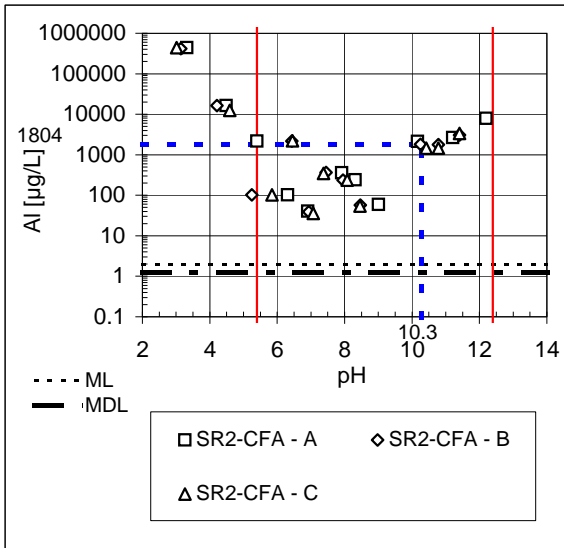
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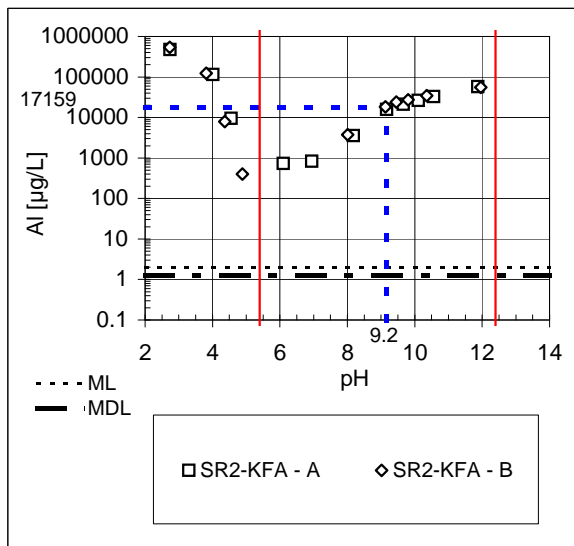
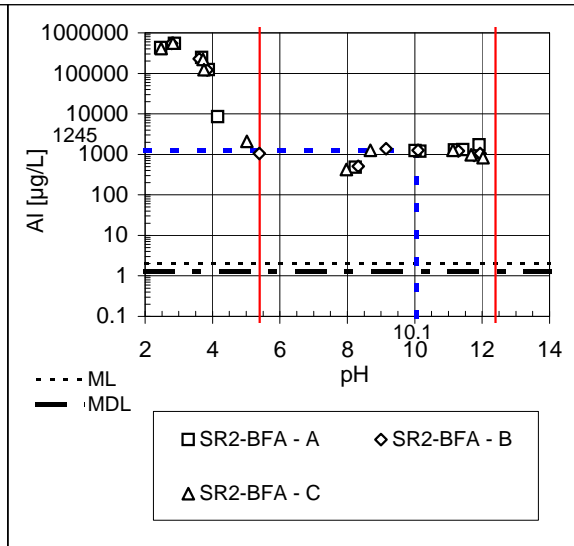
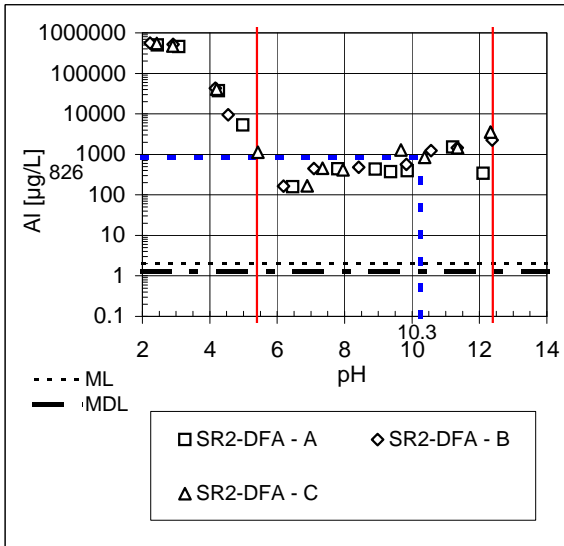
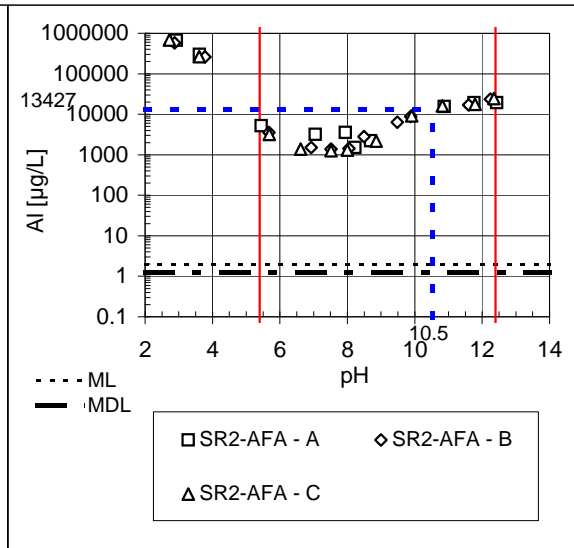
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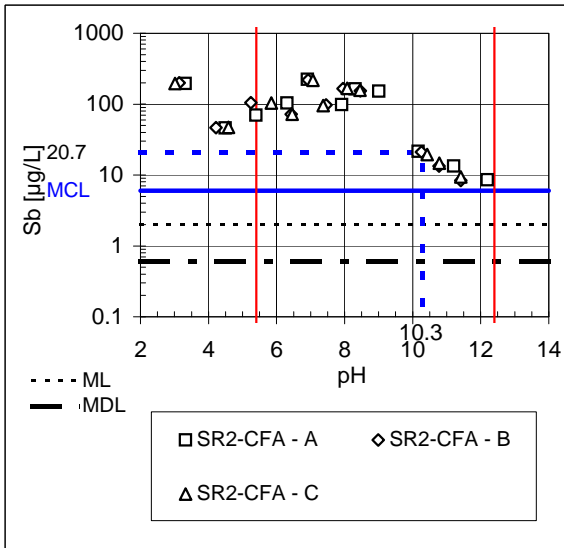
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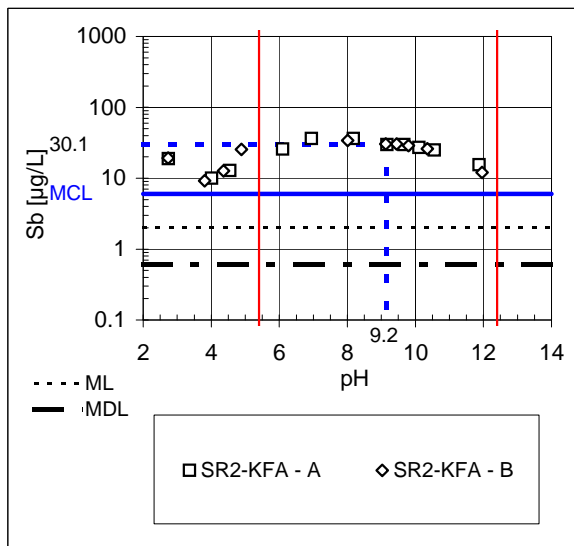
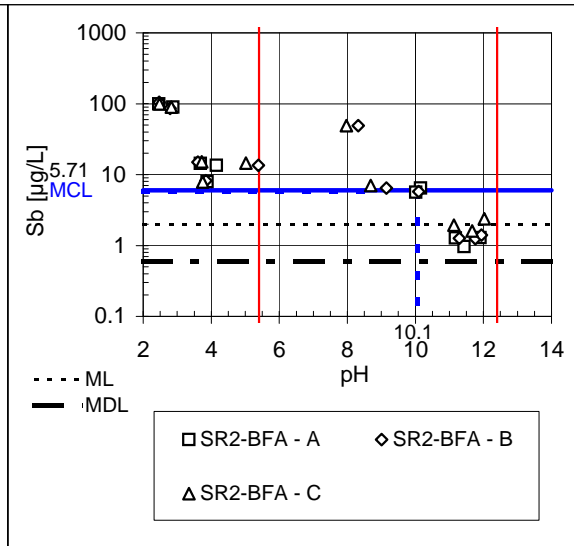
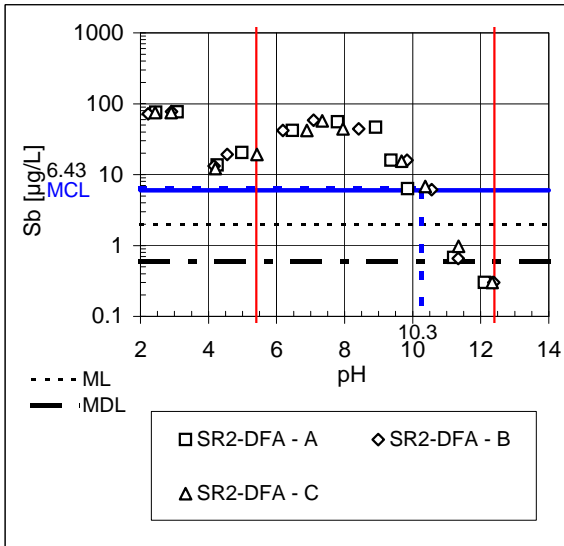
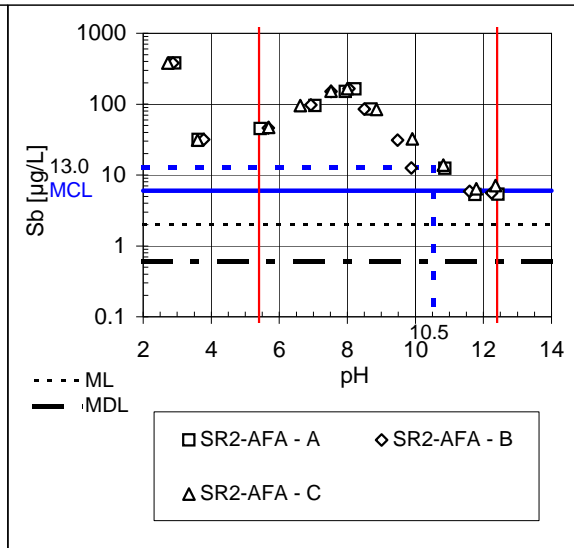
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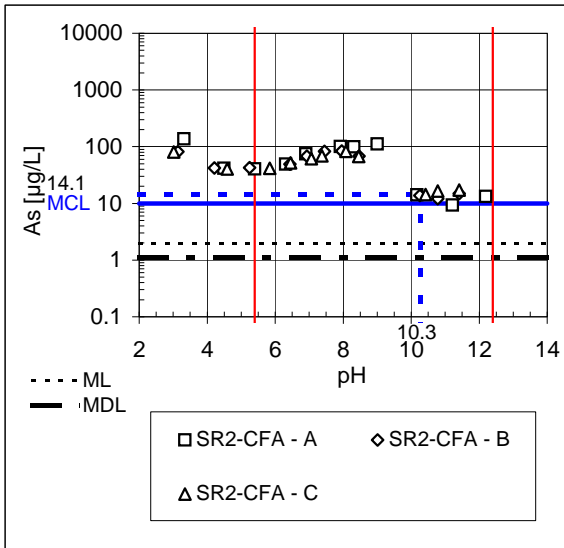
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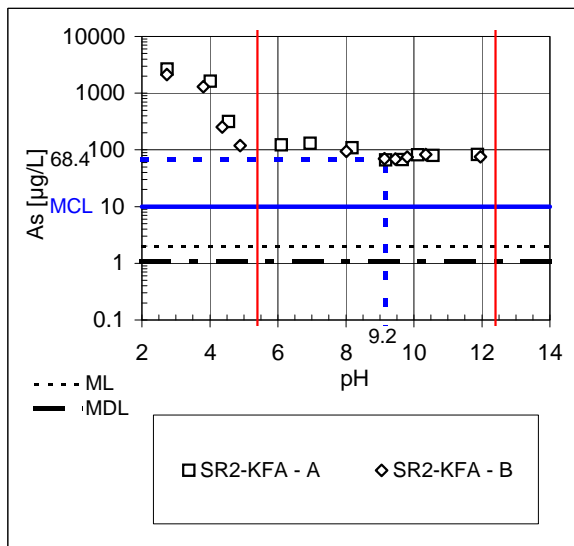
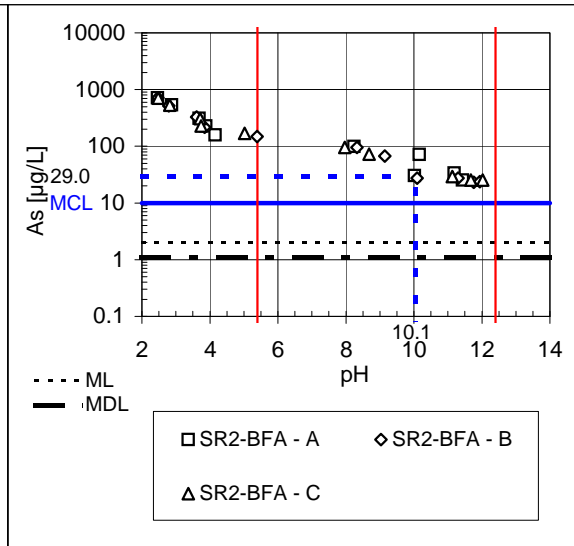
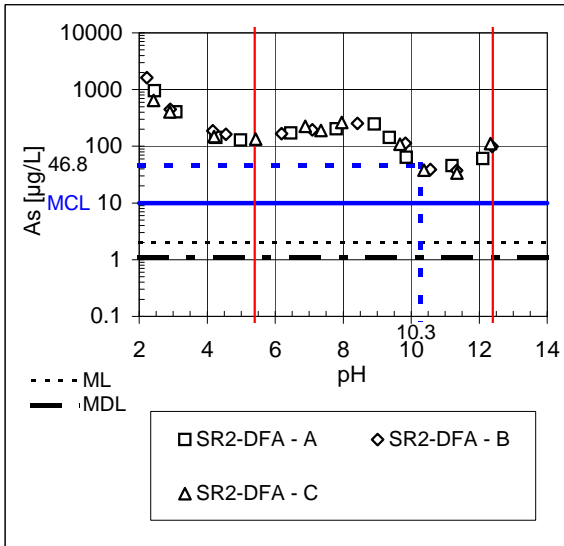
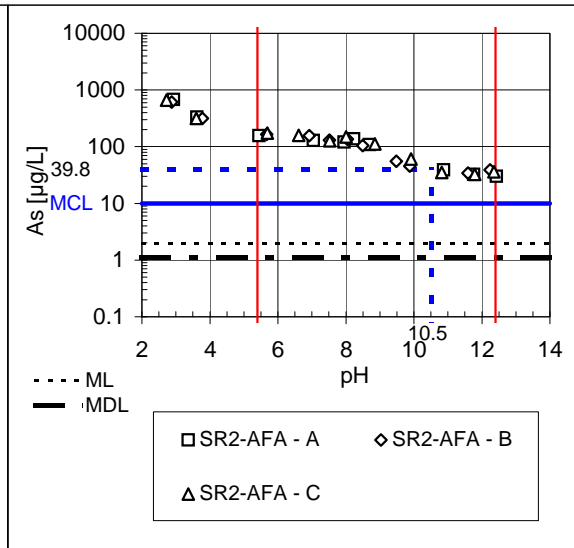
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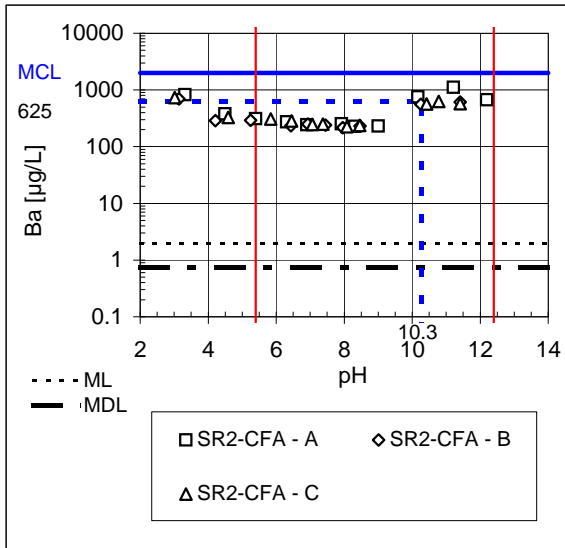
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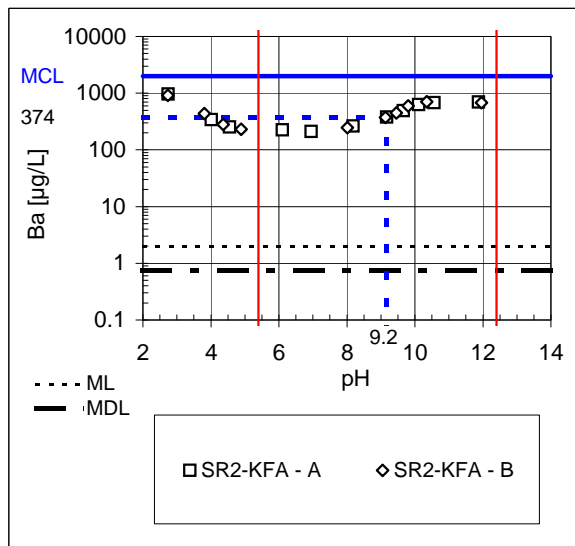
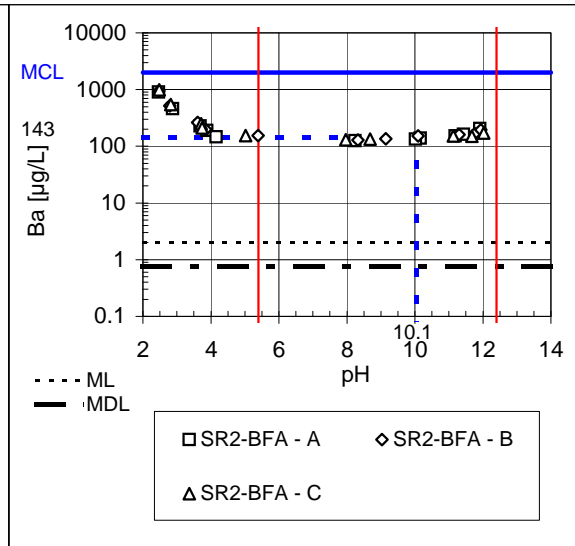
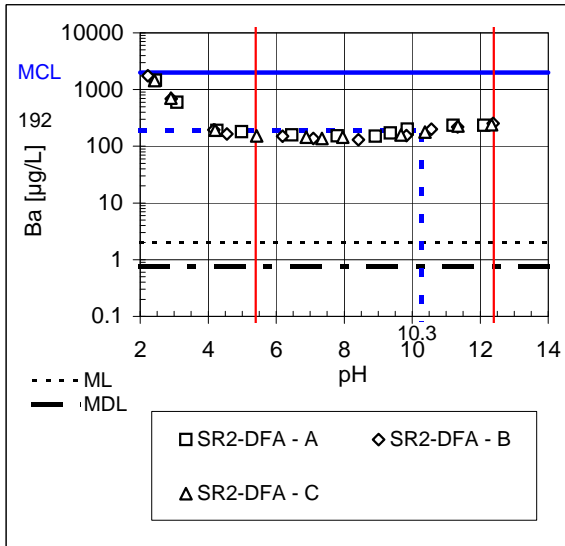
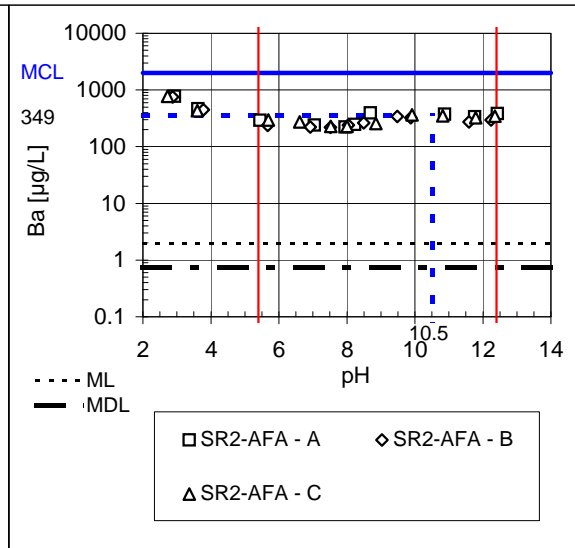
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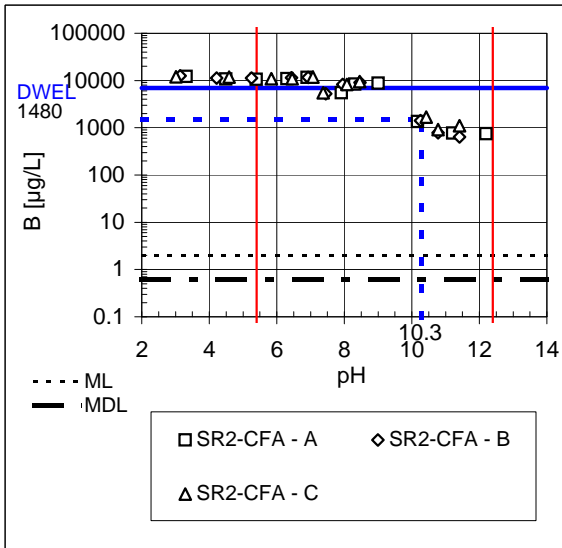
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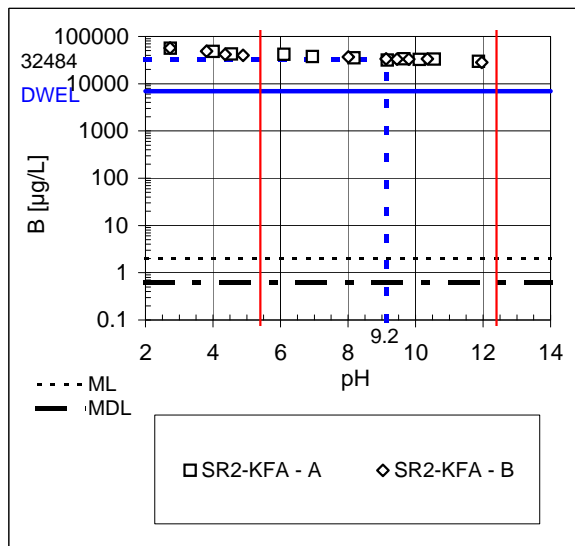
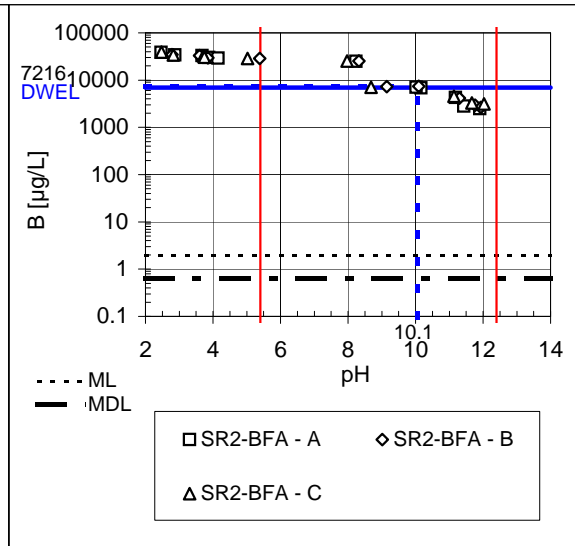
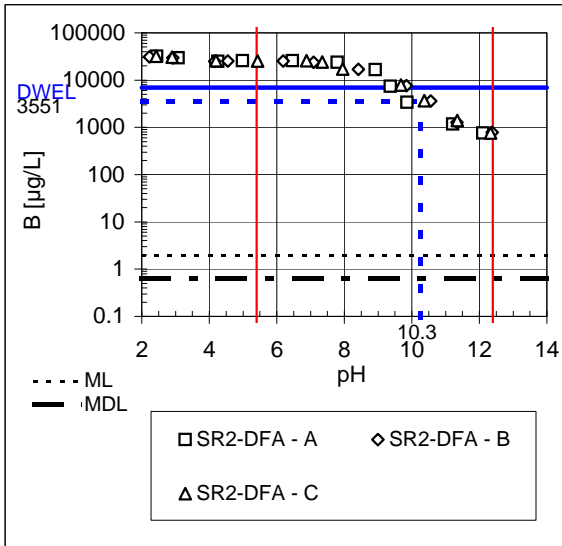
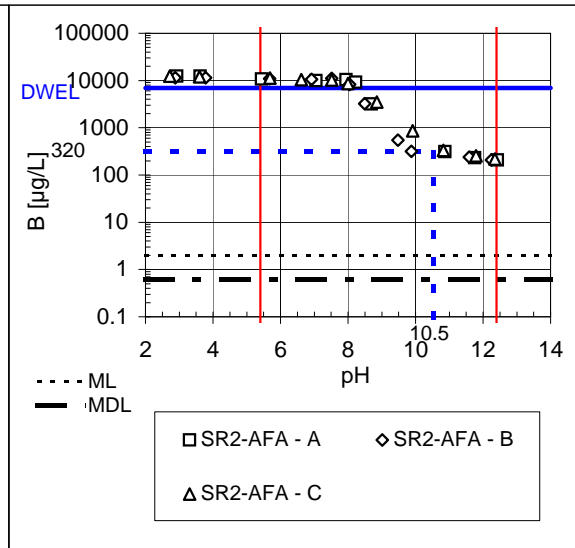
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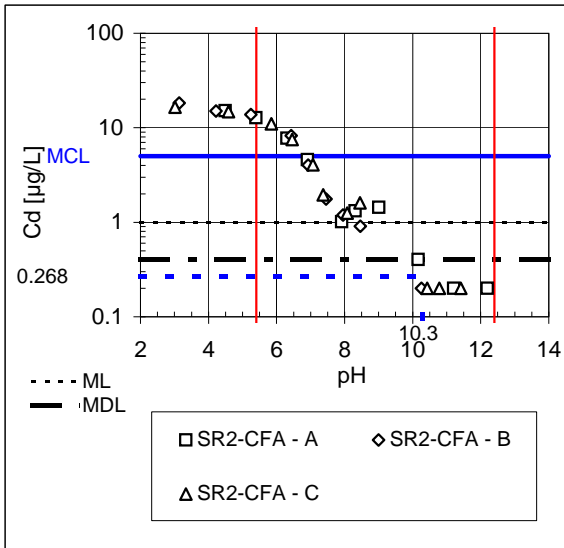
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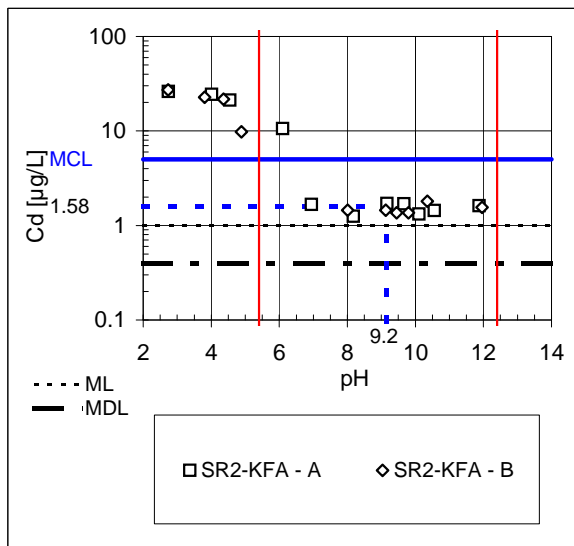
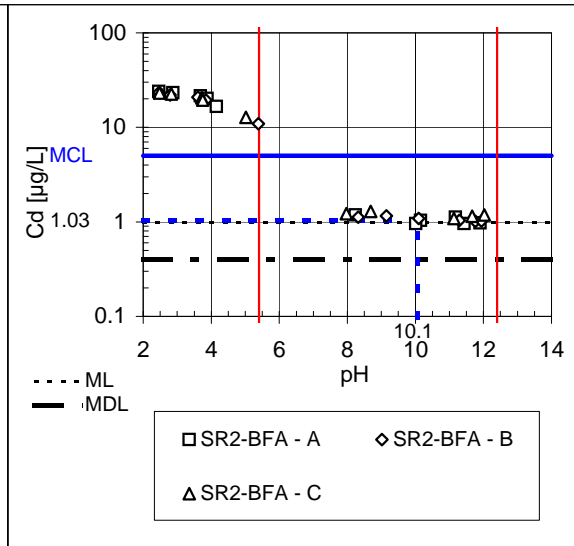
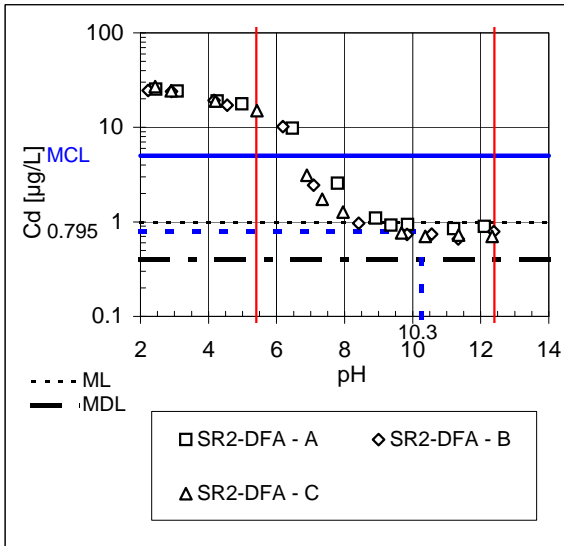
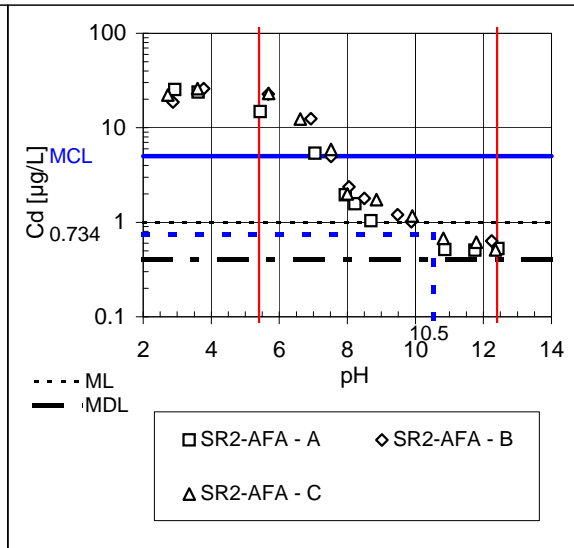
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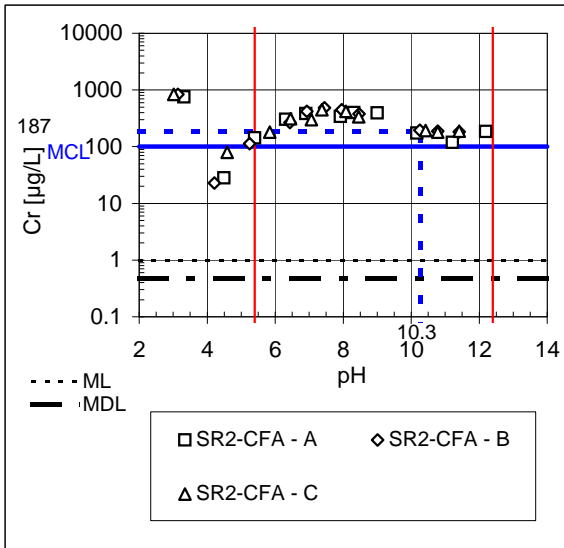
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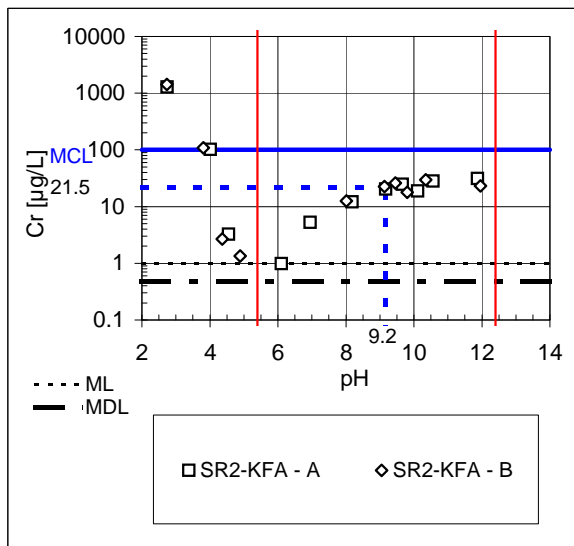
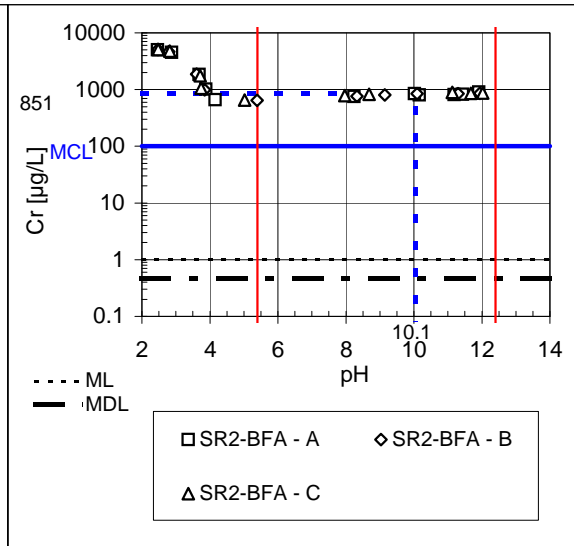
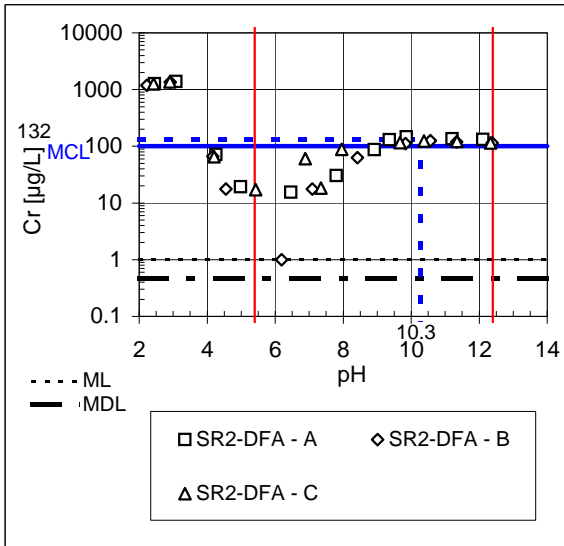
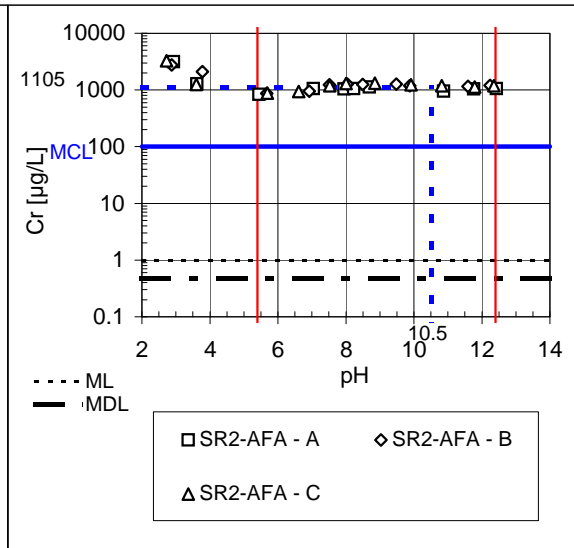
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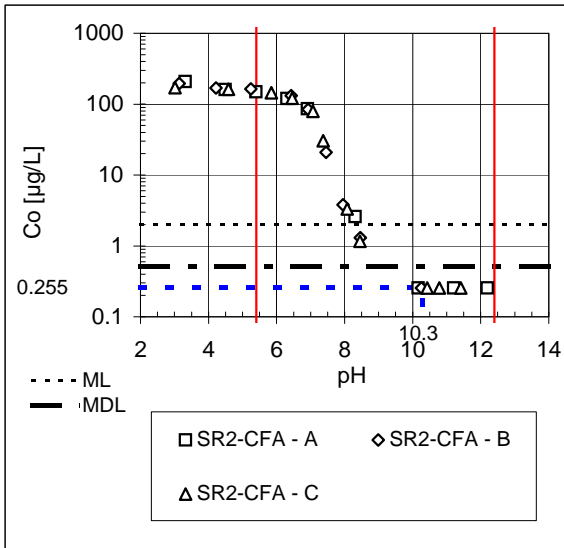
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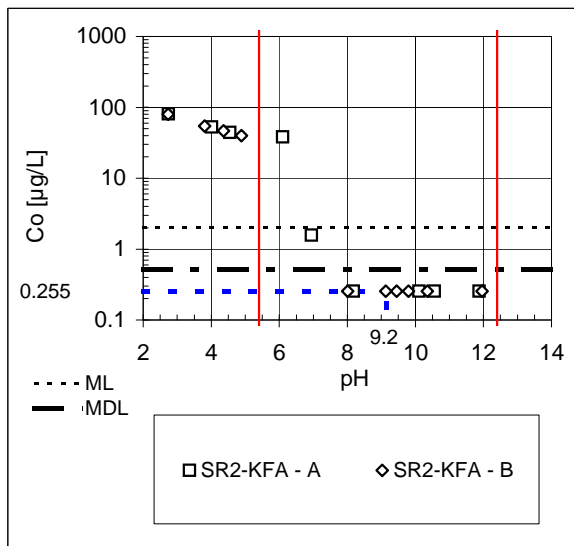
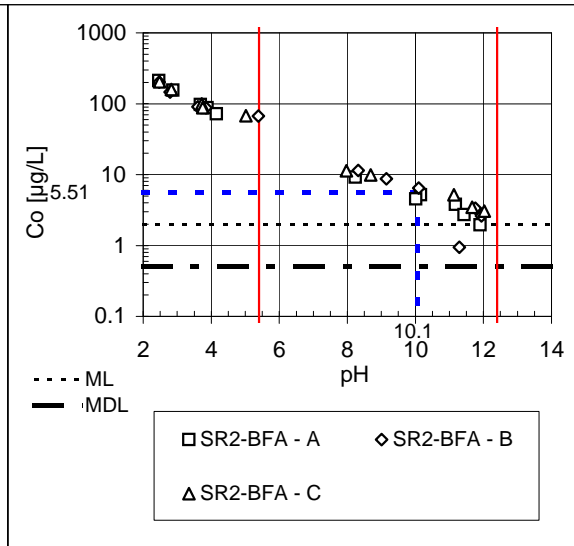
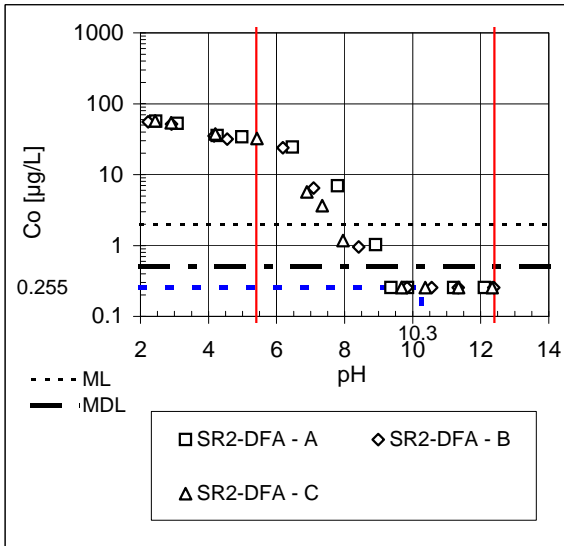
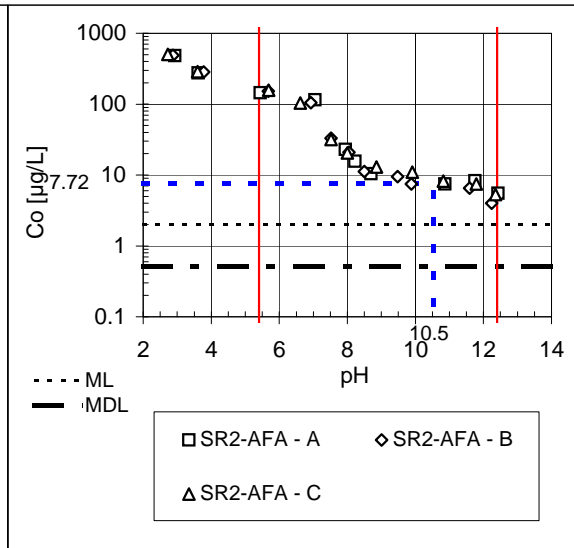
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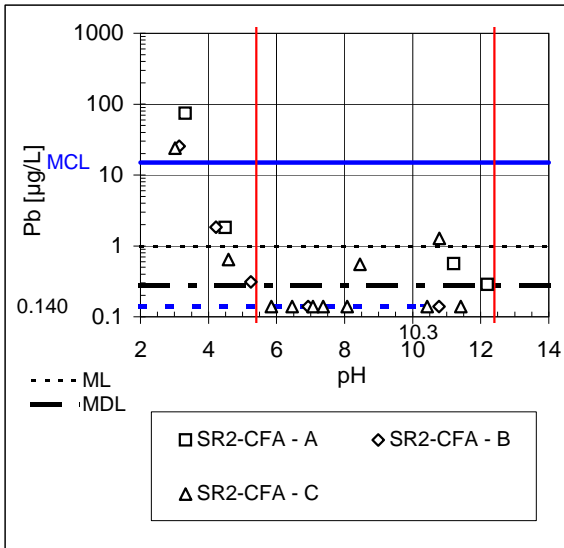
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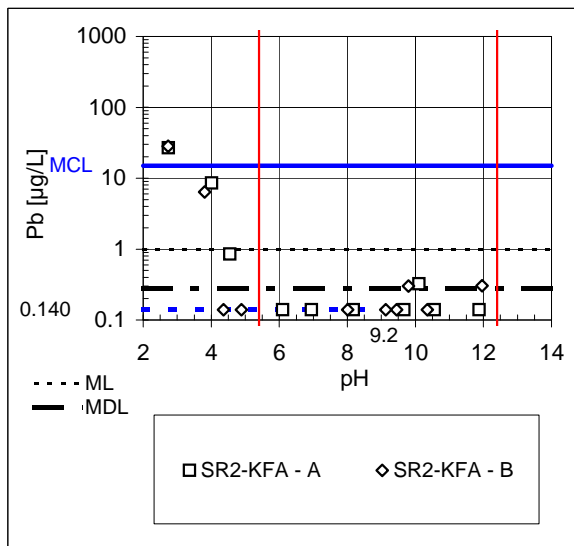
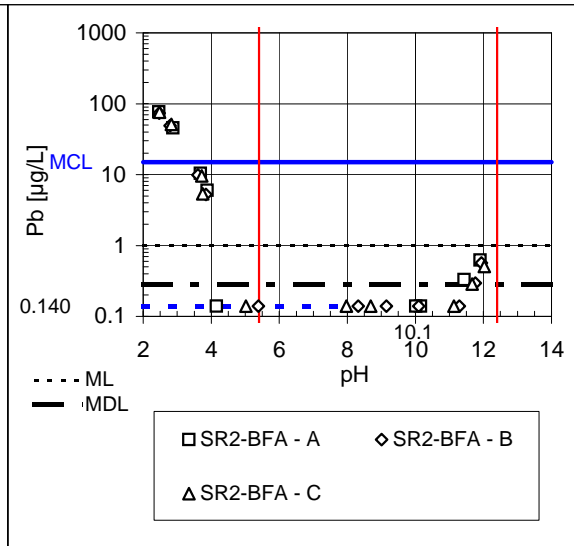
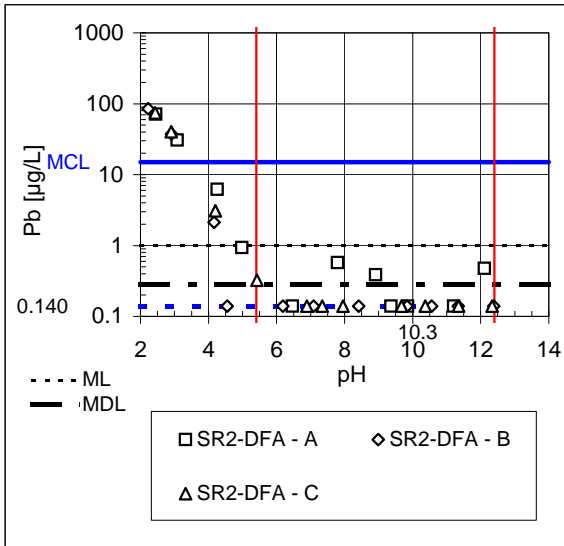
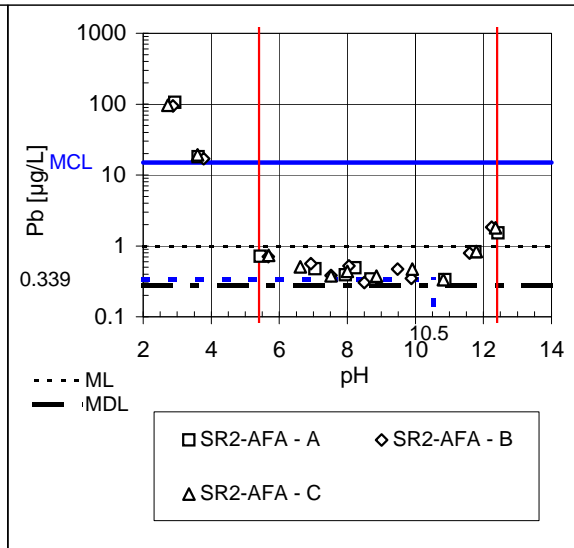
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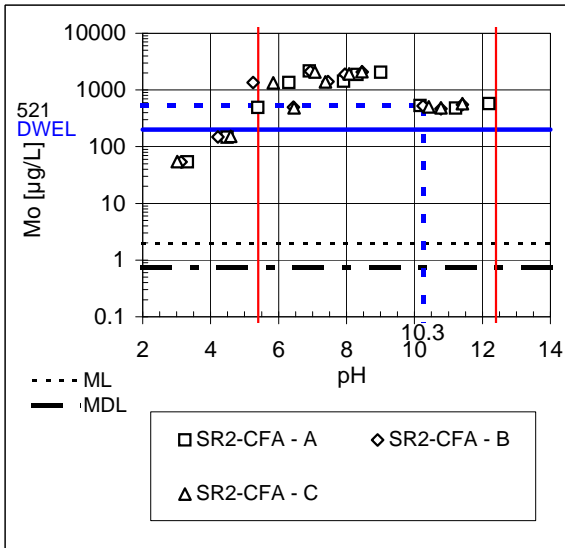
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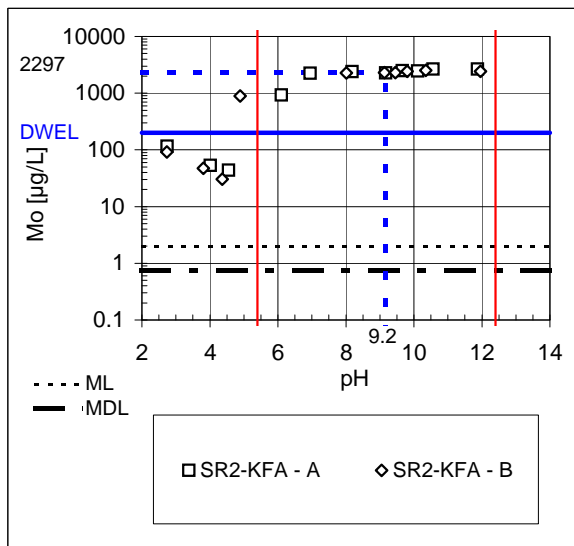
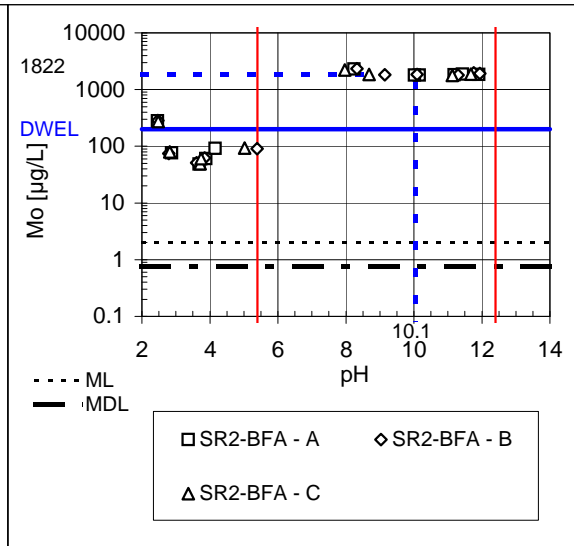
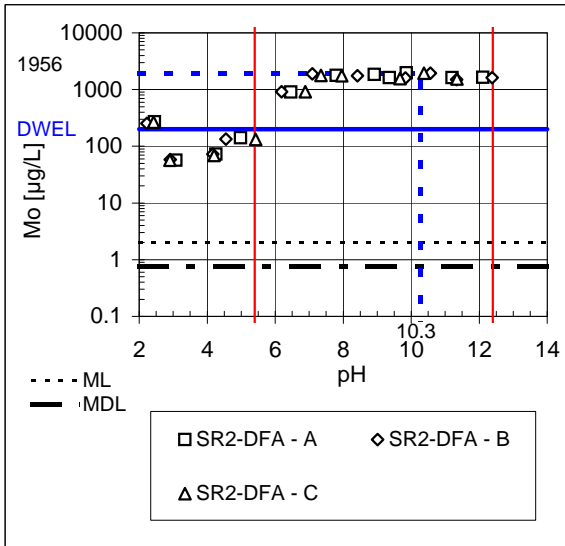
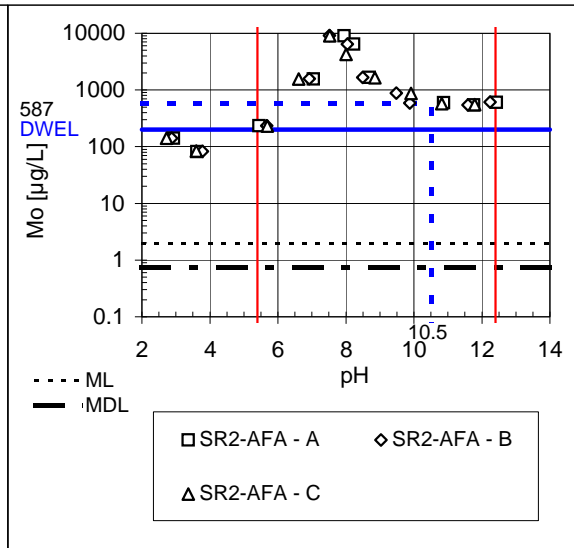
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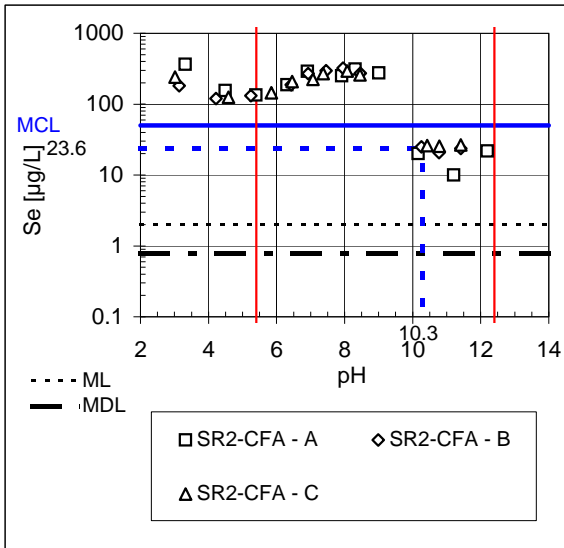
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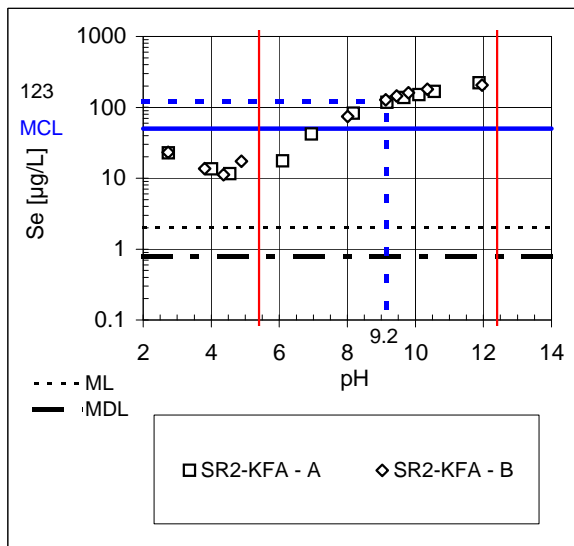
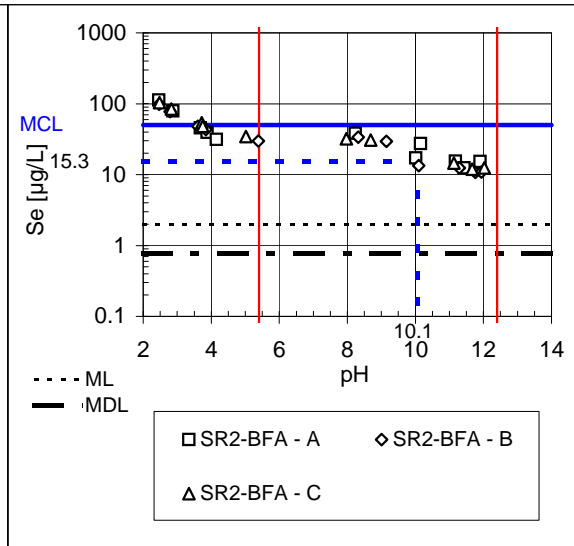
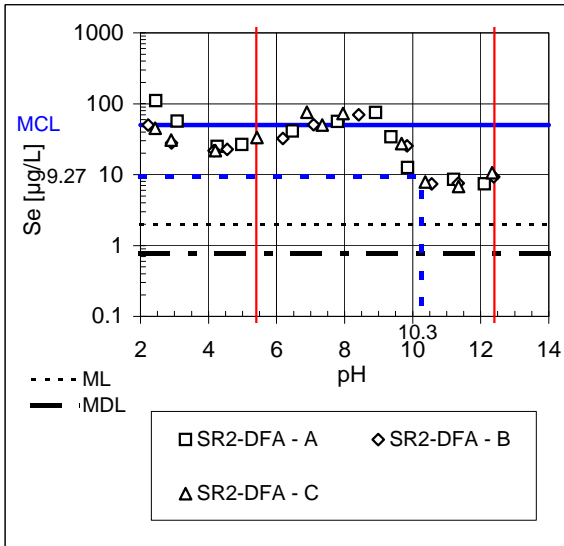
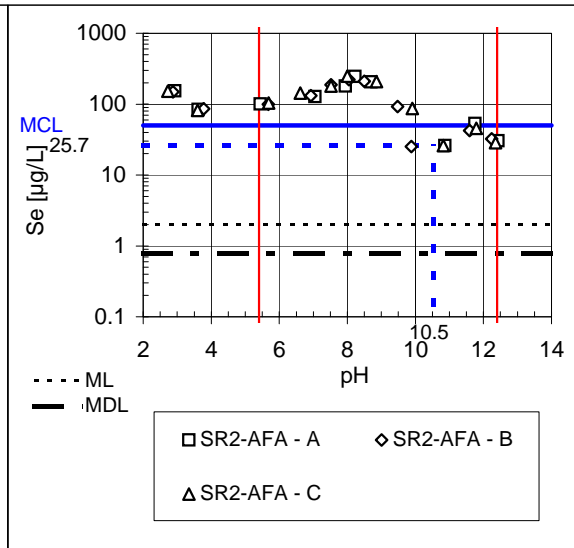
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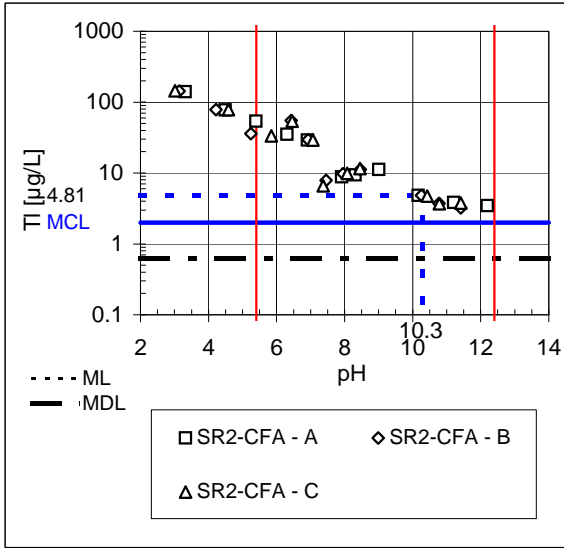
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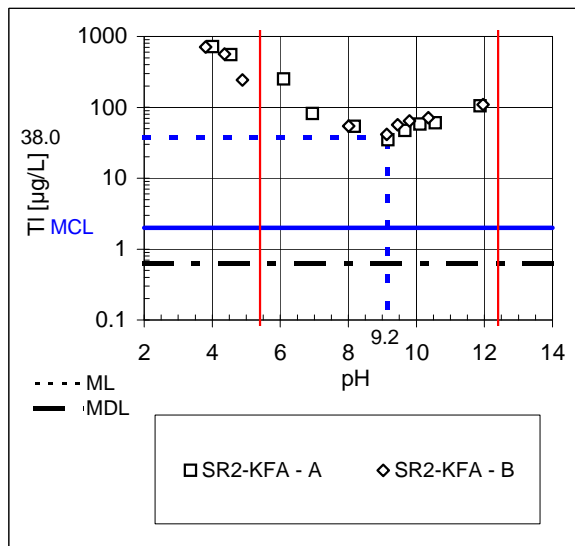
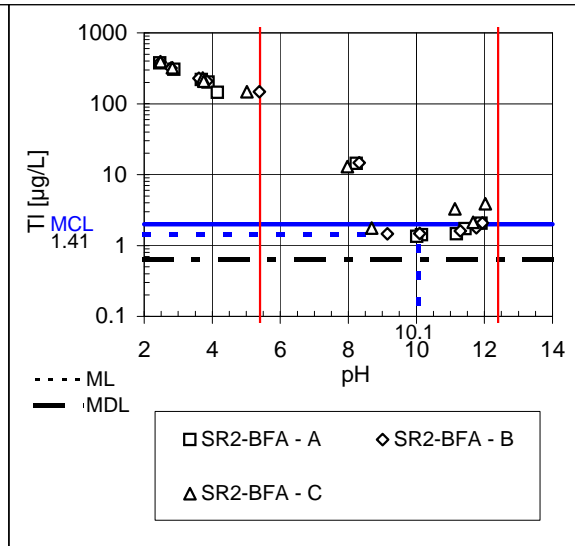
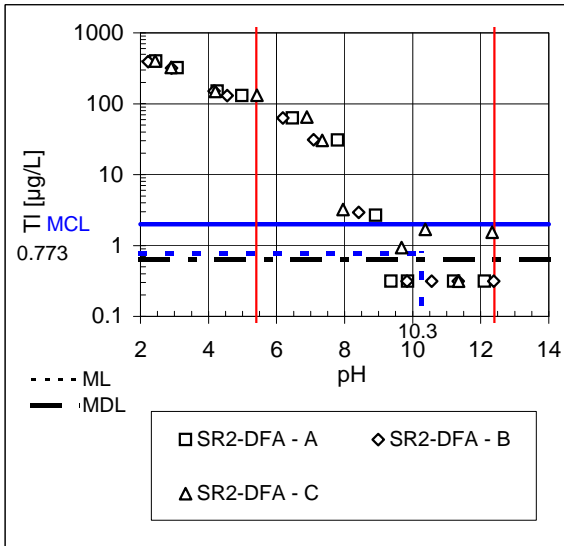
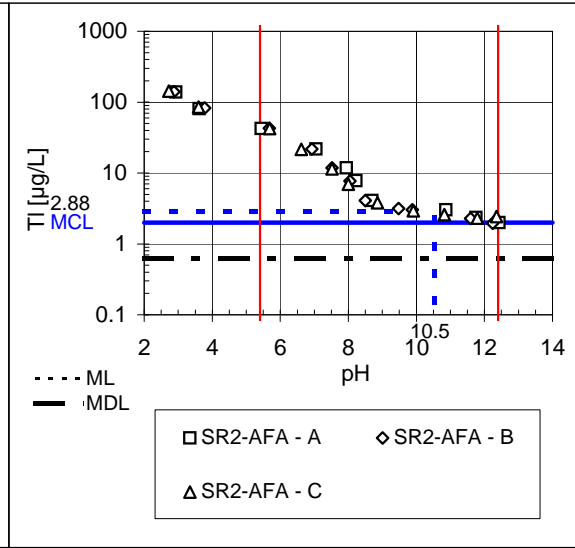
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On



Gypsum (Gyp-U, Gyp-W) Comparisons

Facility N

Coal: bituminous

APC: FO+SCR+ESP(CS)

Gyp-U

Gyp-W

NAU
(unwashed)

NAW
(washed)

Facility O

Coal: bituminous

APC: FO+SCR+ESP(CS)

OAU
(unwashed)

OAW
(washed)

Facility P

Coal: bituminous

APC: FO+ SCR & SNCR +ESP(CS)

PAD (U)
(unwashed)

QAU
(unwashed)

Facility Q

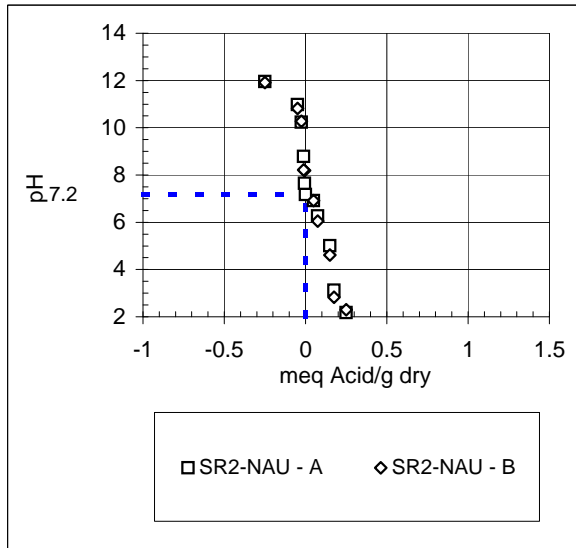
Coal: sub-bituminous

APC: FO+SCR+ESP(CS)

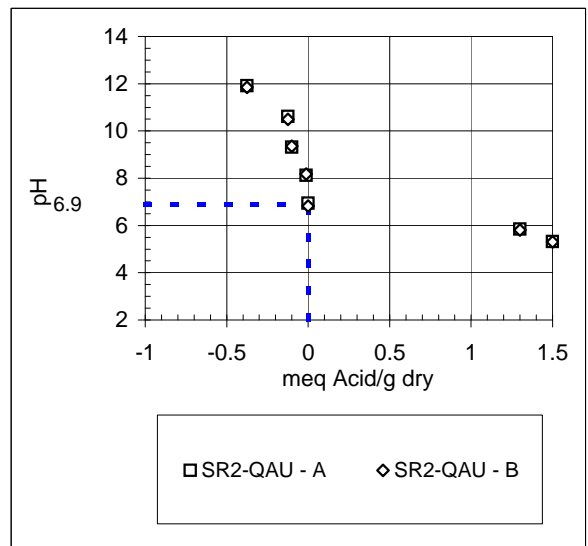
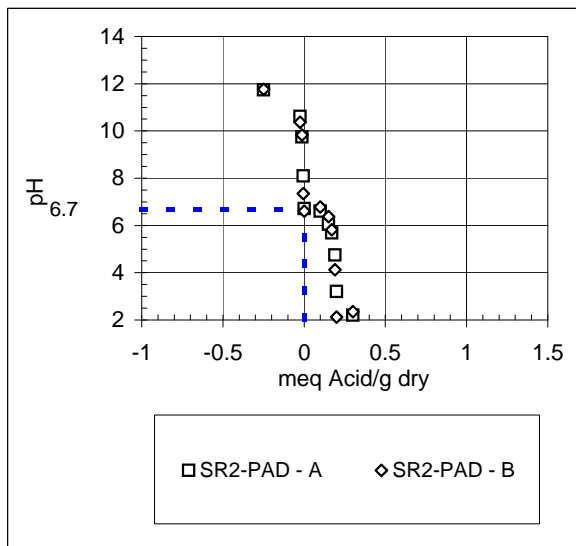
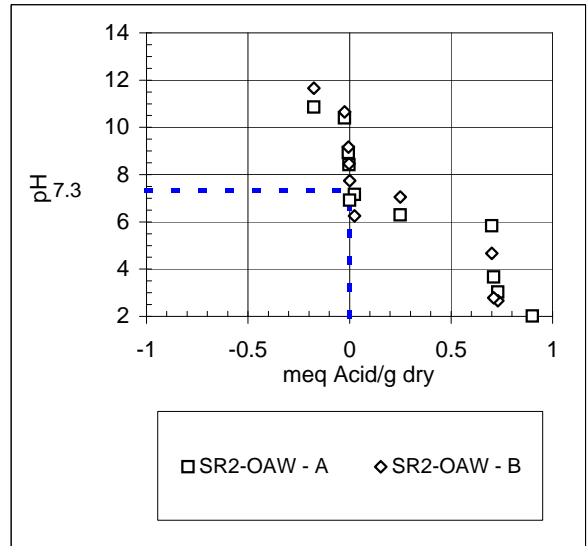
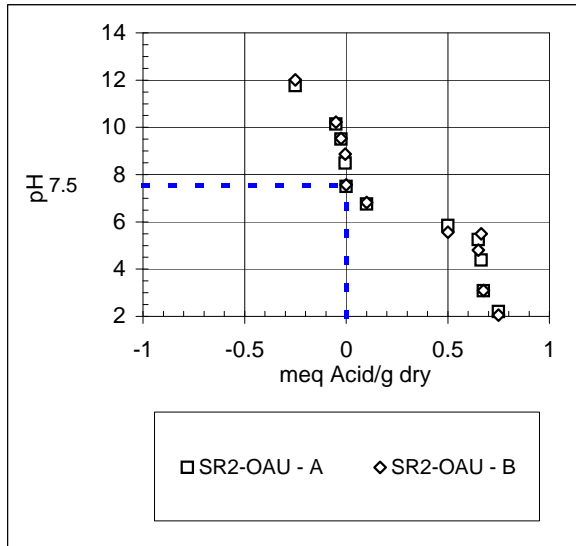
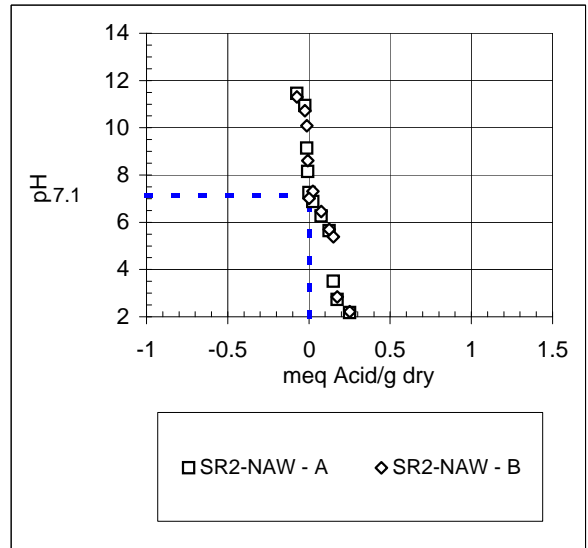


Gypsum Comparison

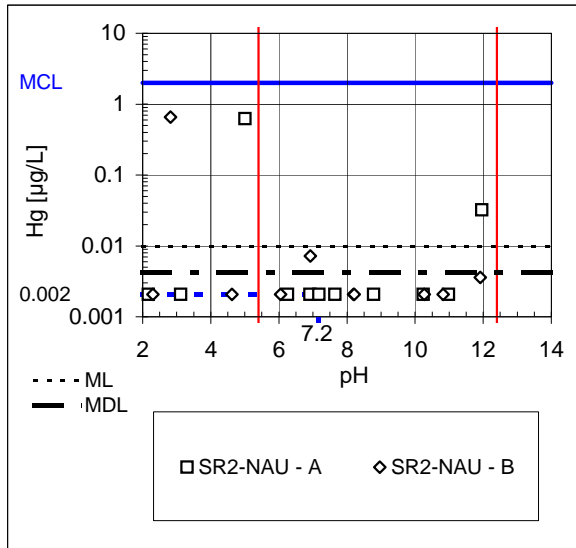
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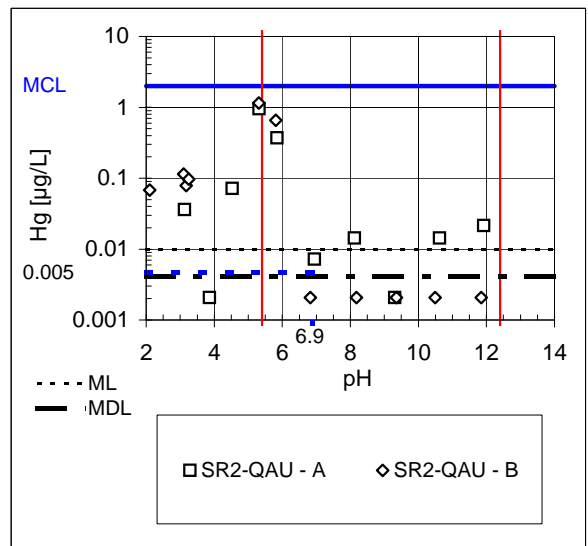
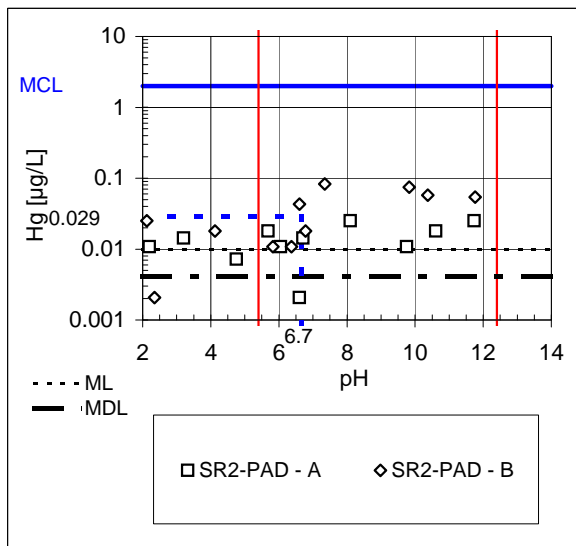
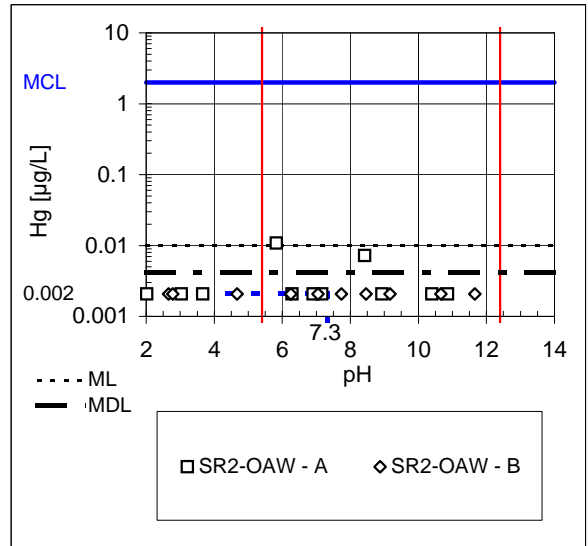
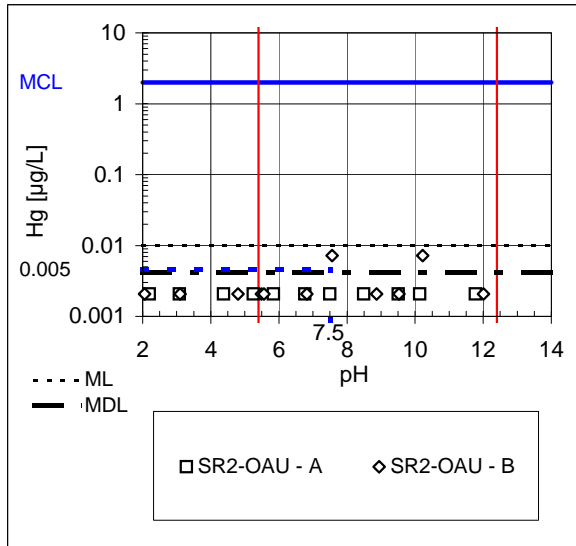
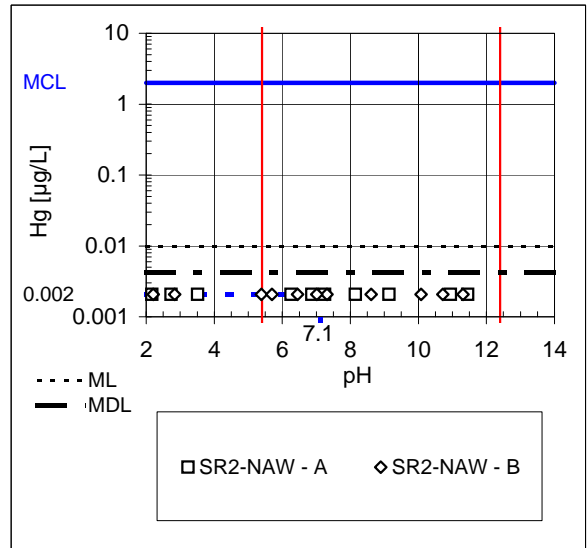
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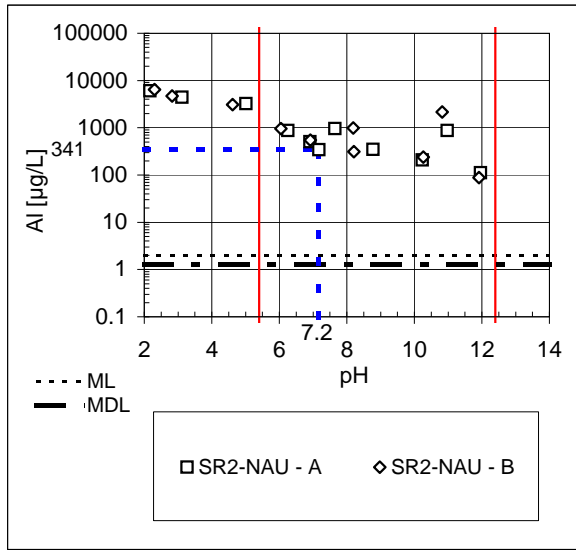
Gyp-U



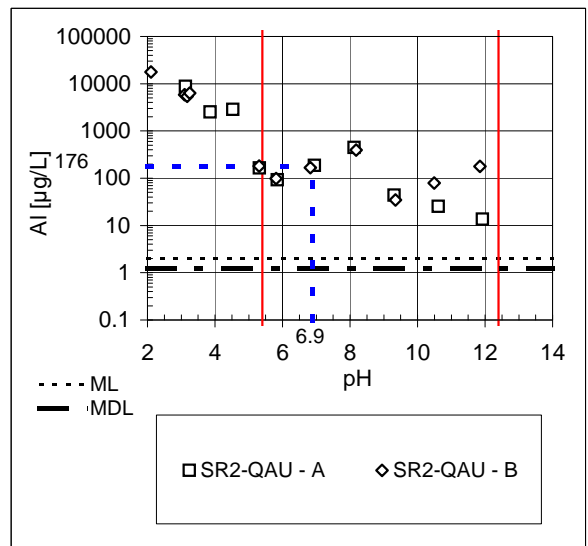
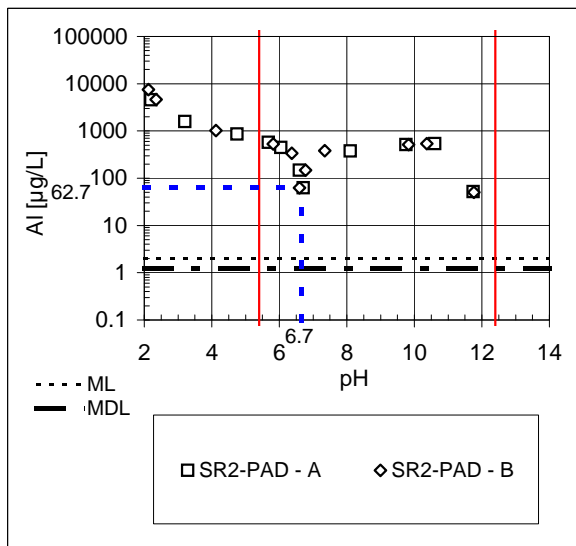
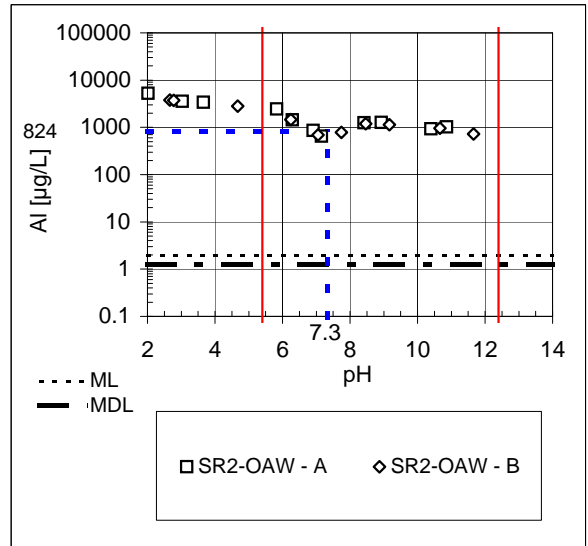
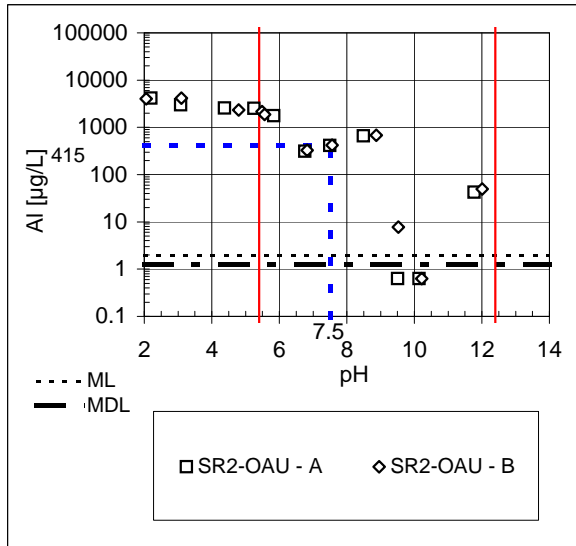
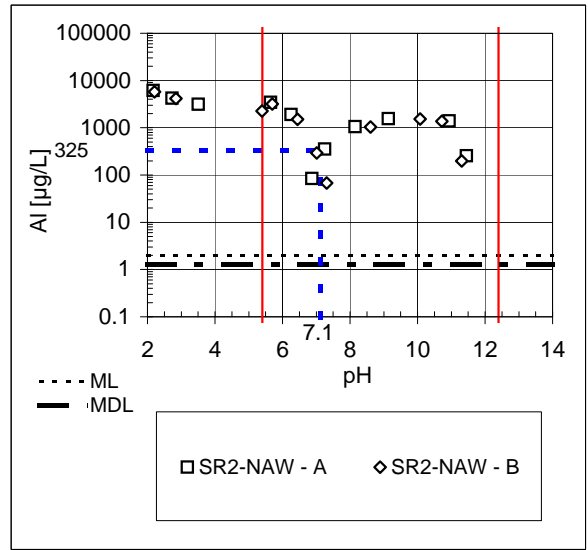
Gyp-W



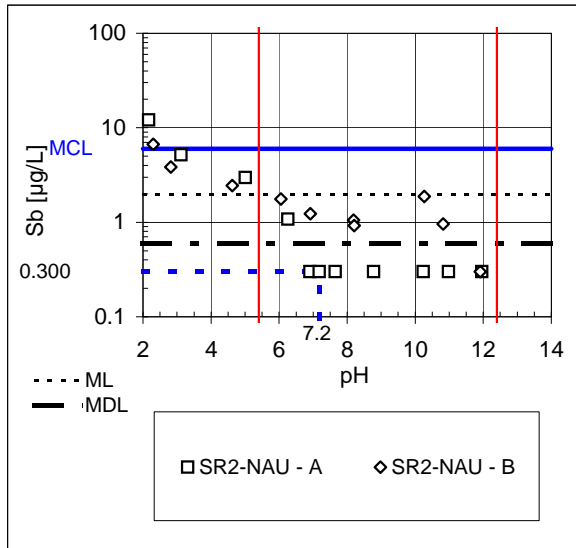
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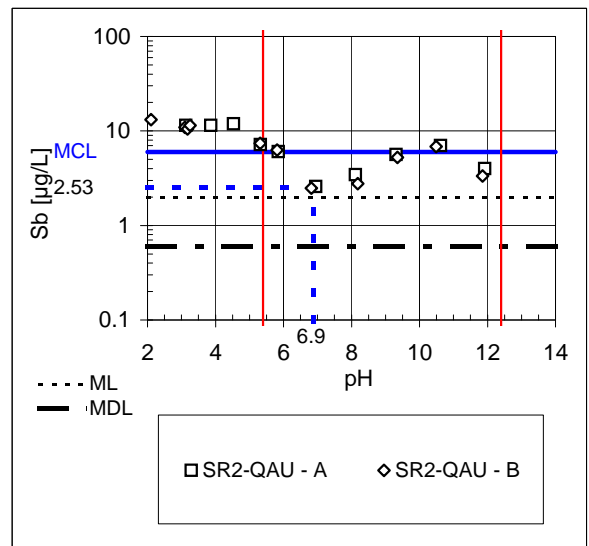
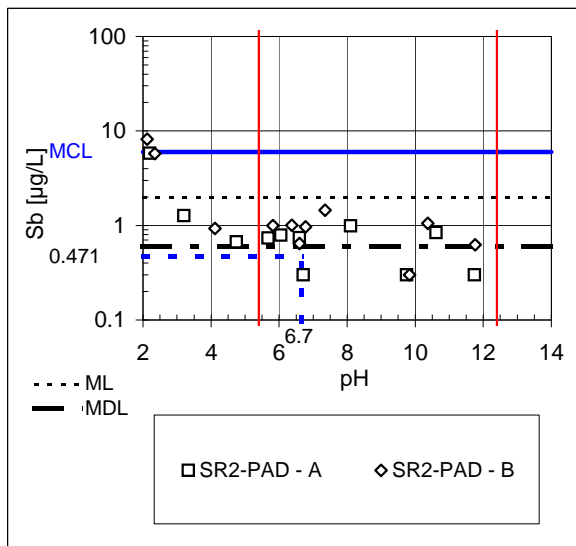
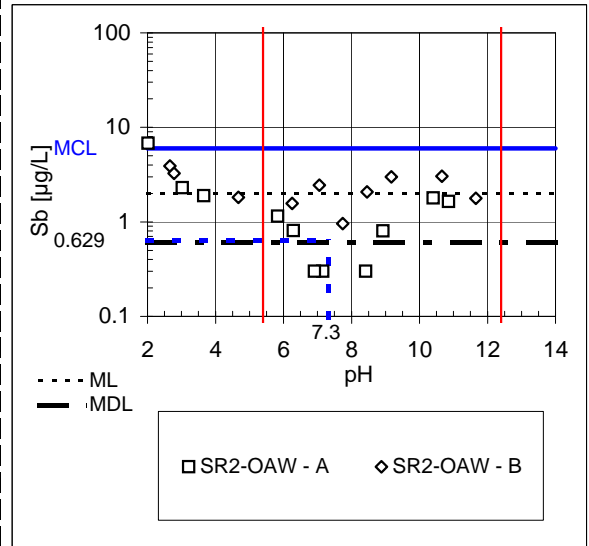
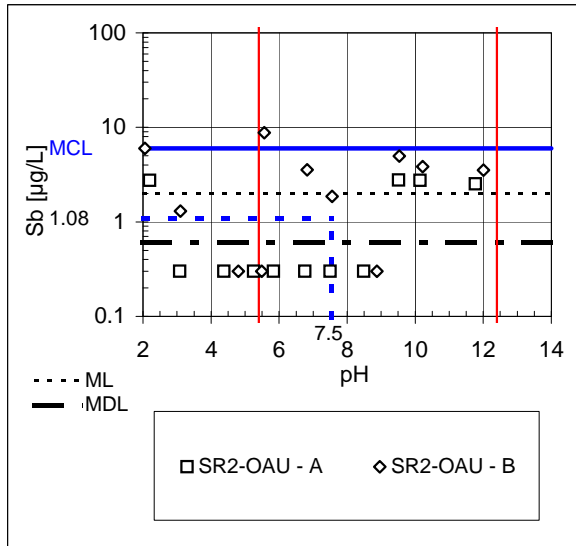
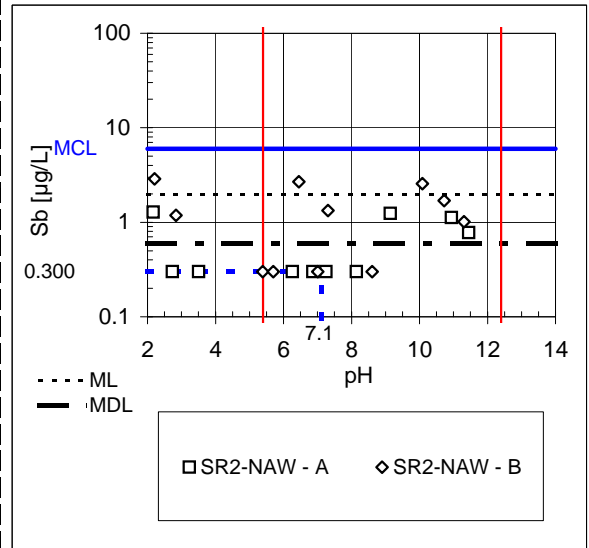
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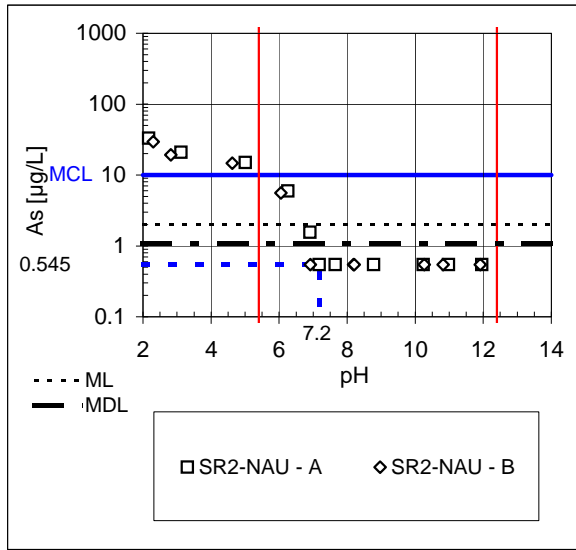
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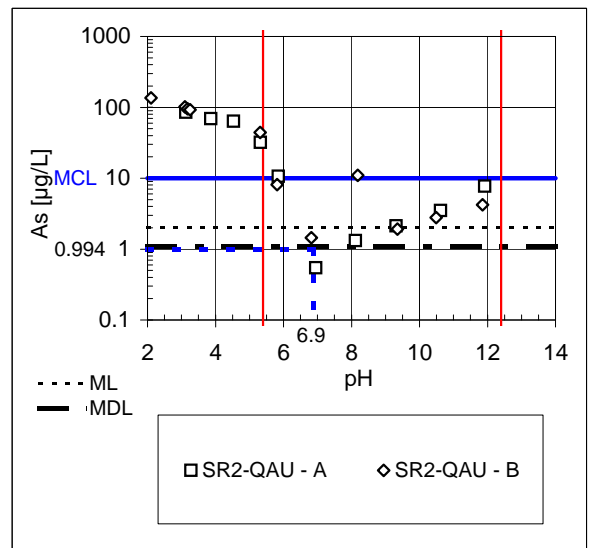
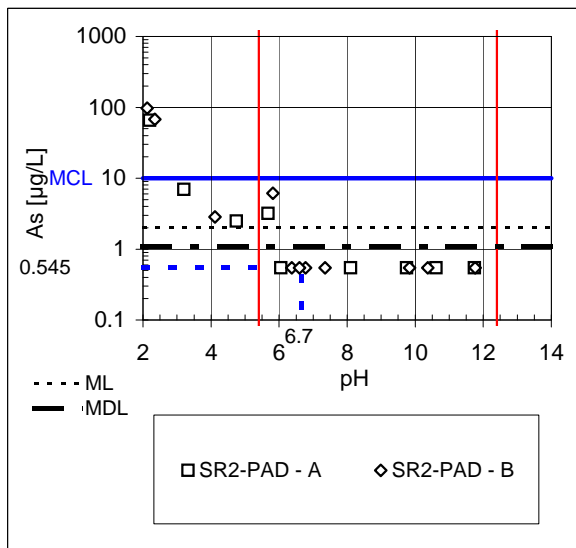
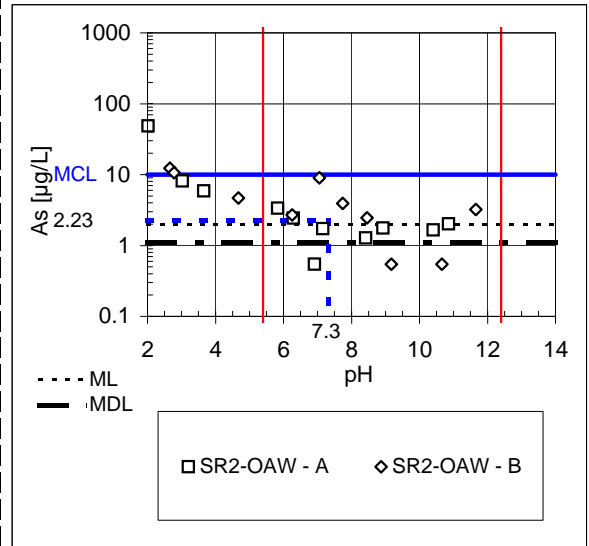
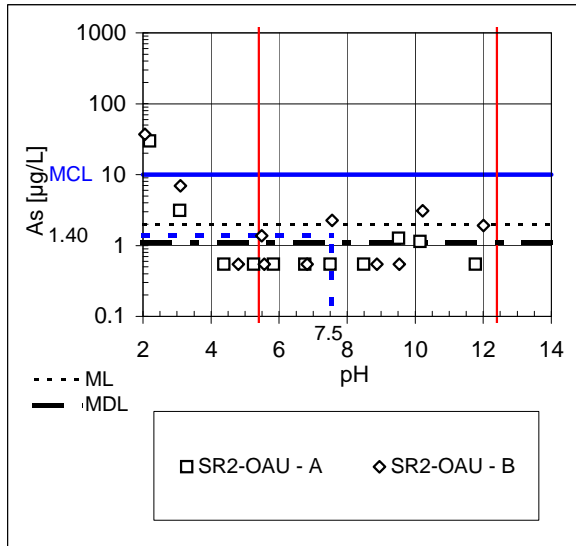
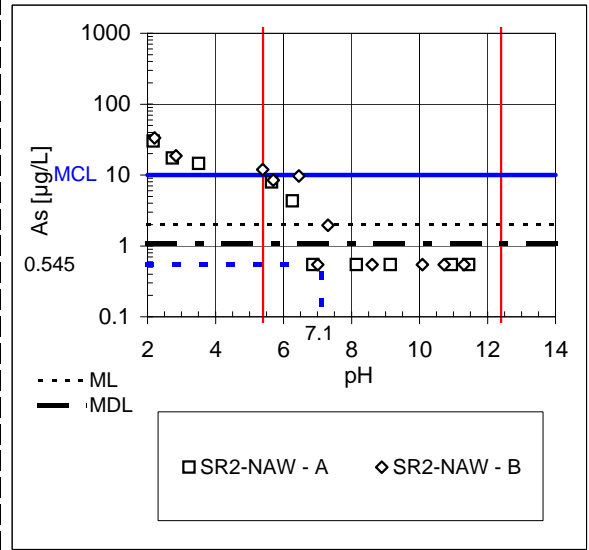
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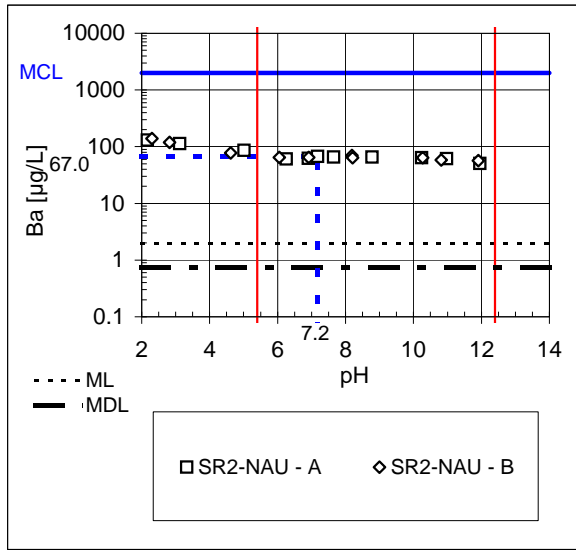
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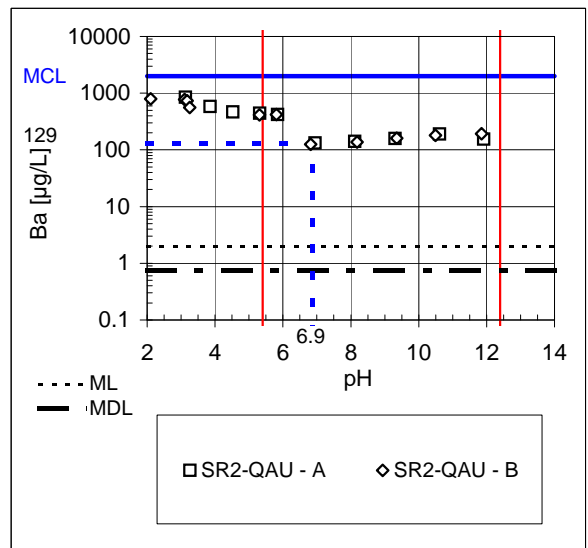
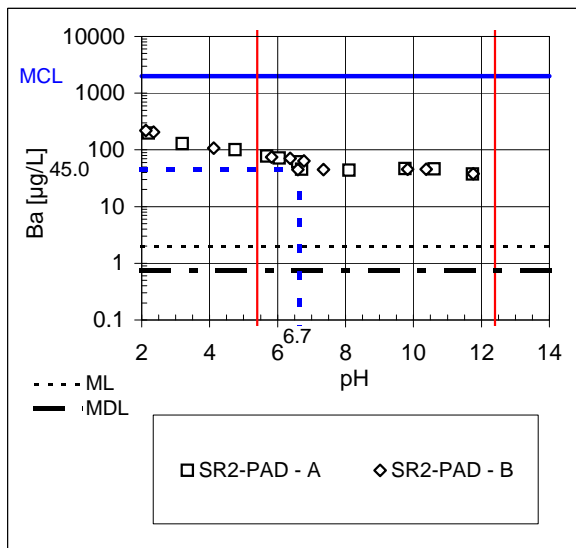
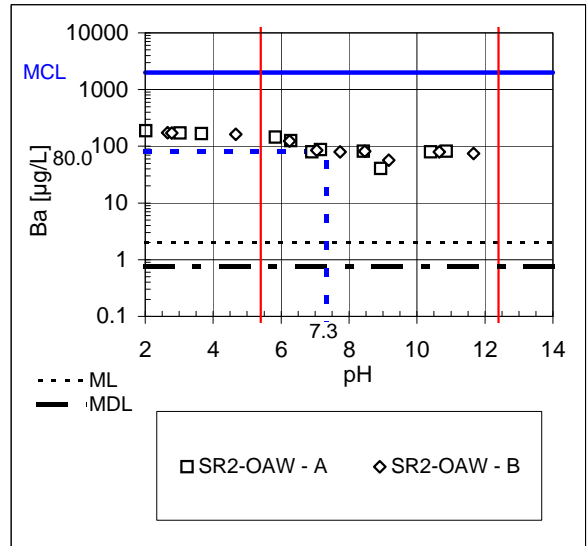
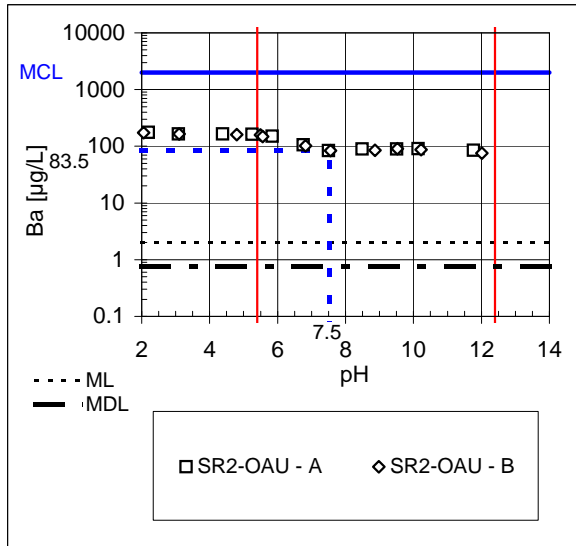
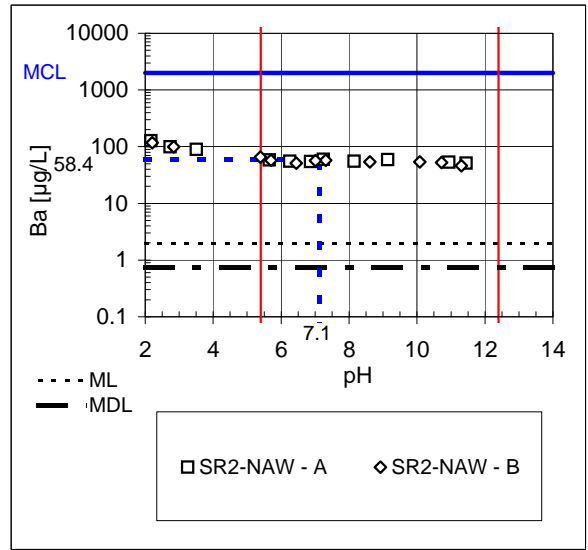
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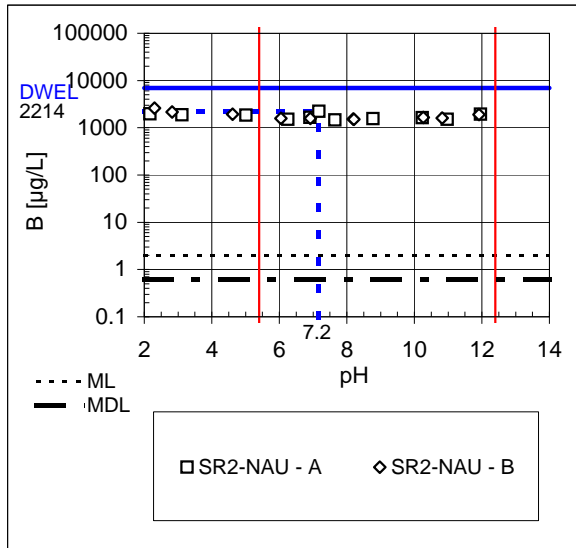
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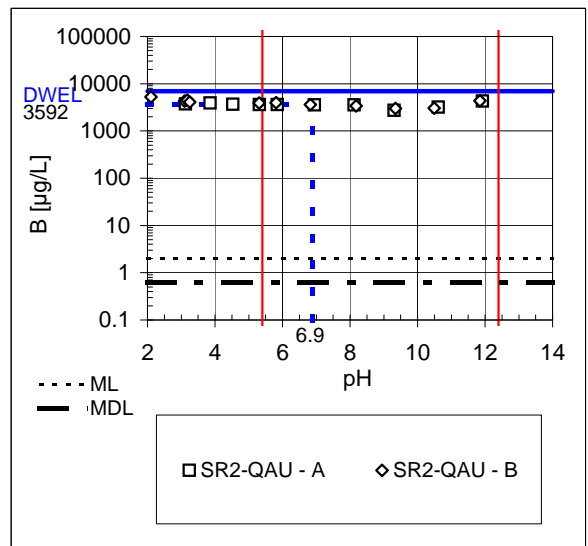
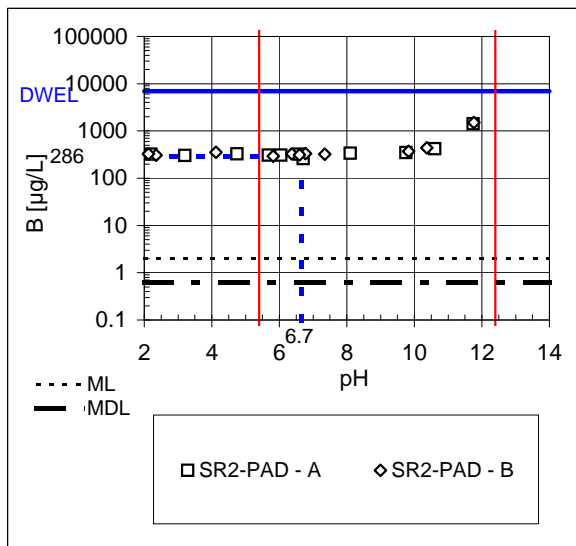
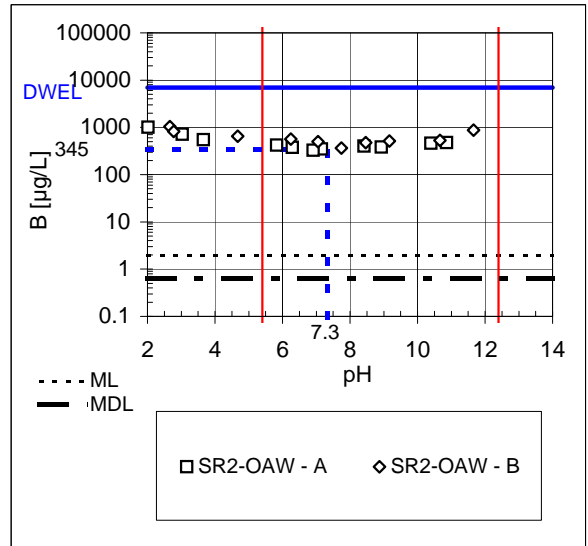
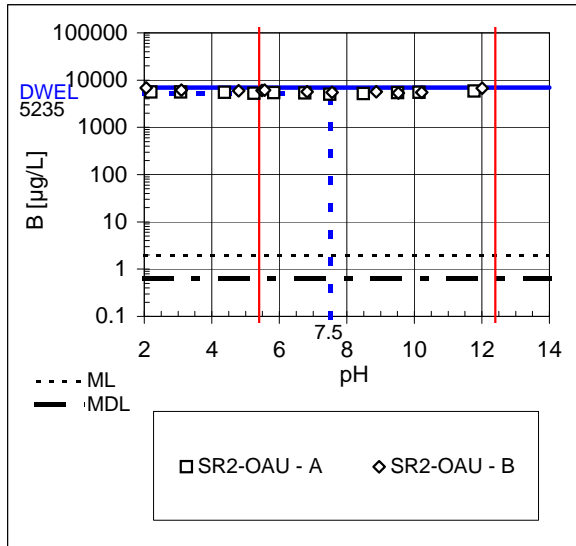
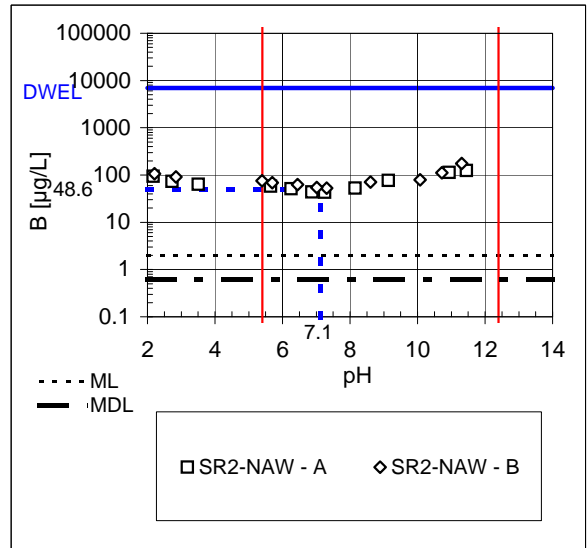
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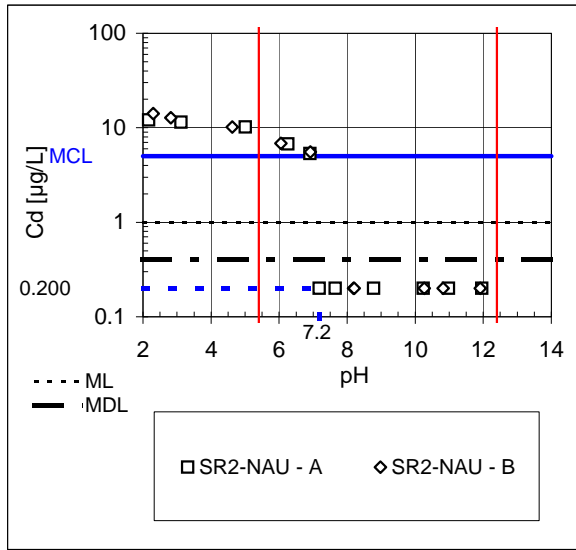
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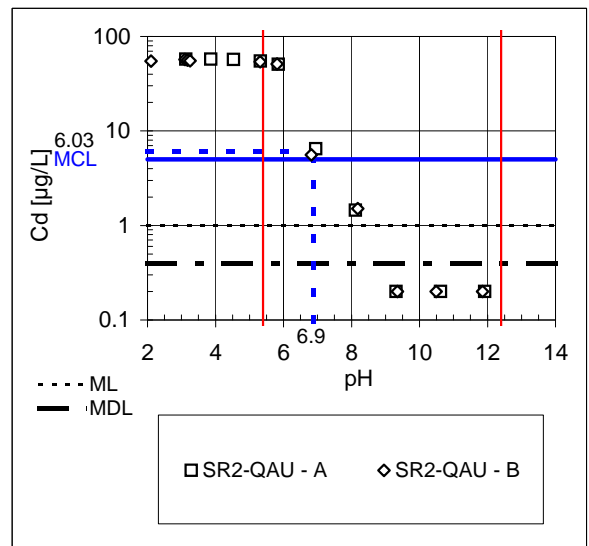
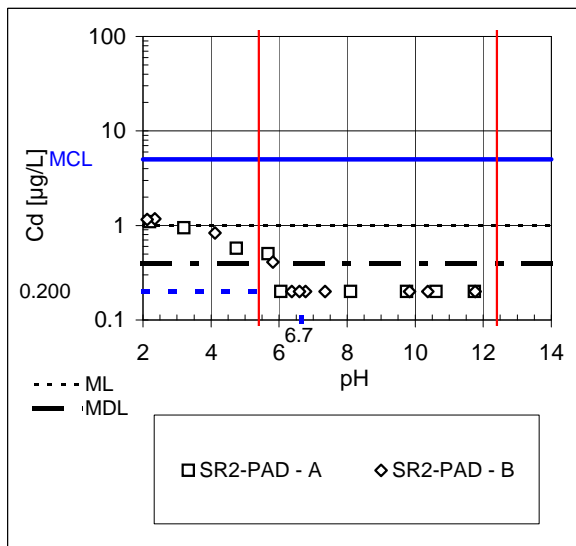
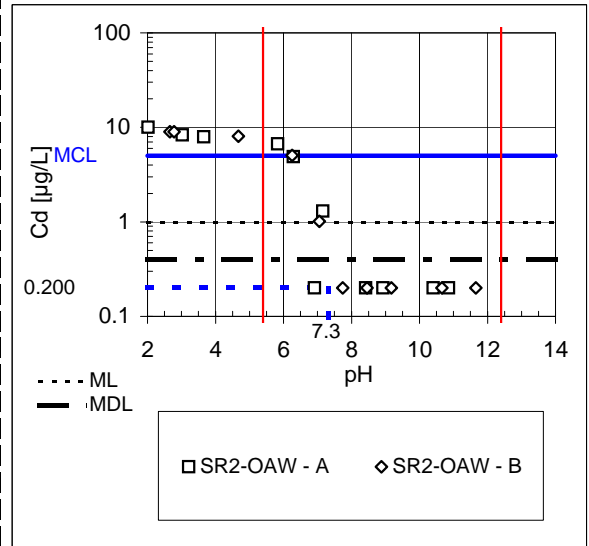
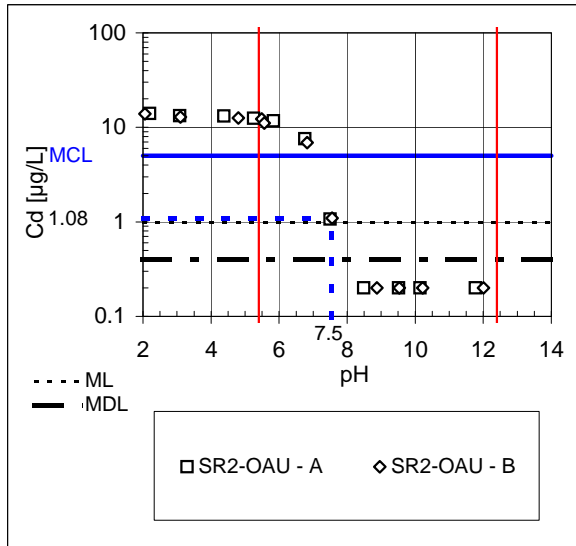
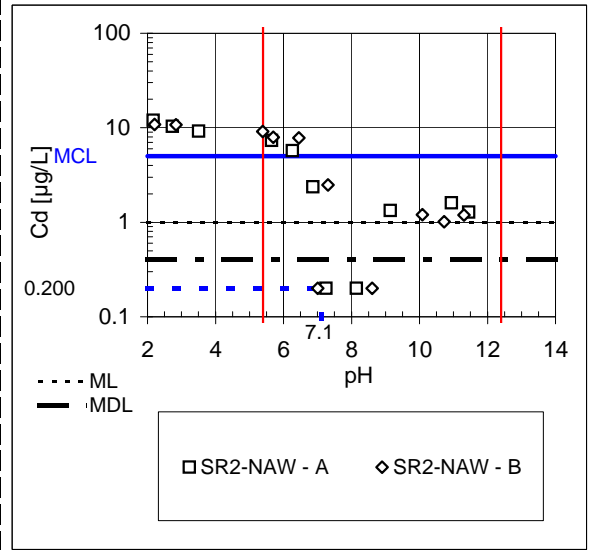
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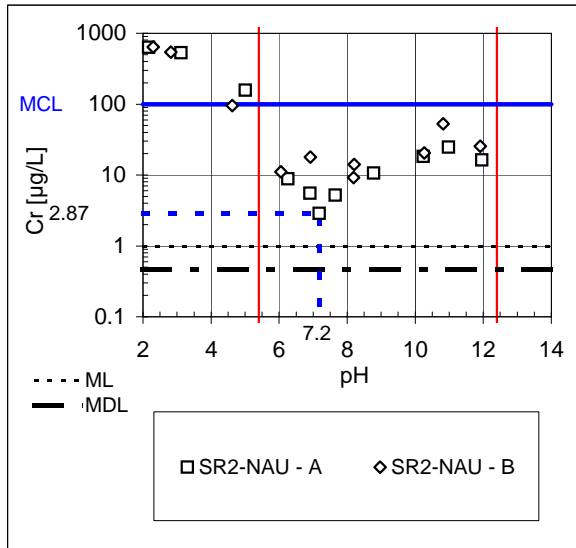
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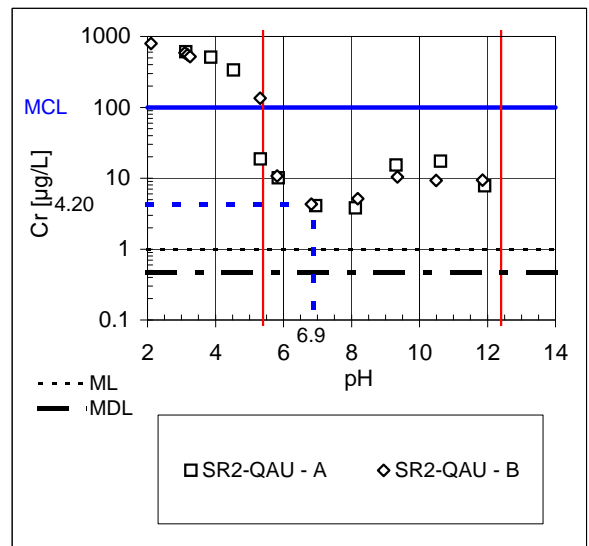
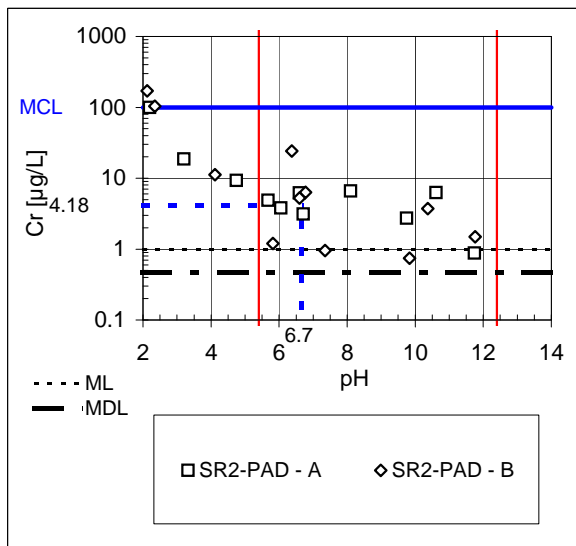
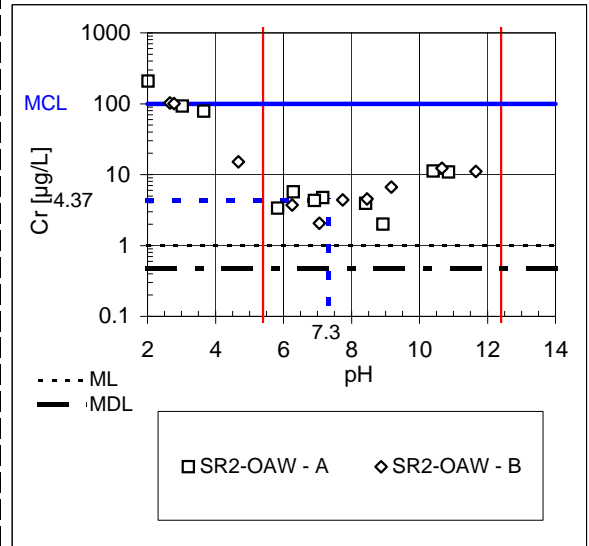
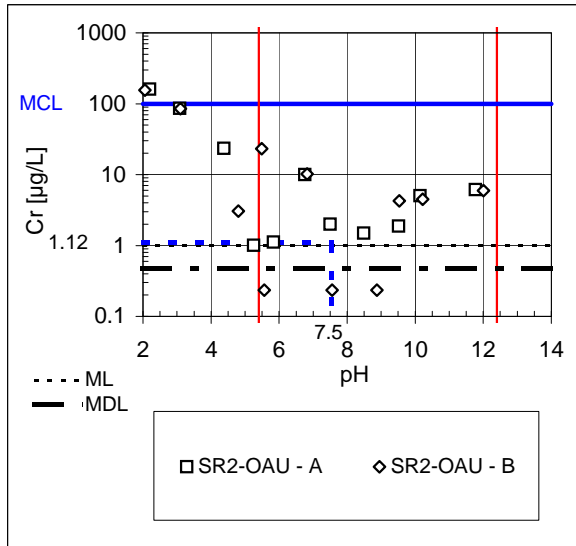
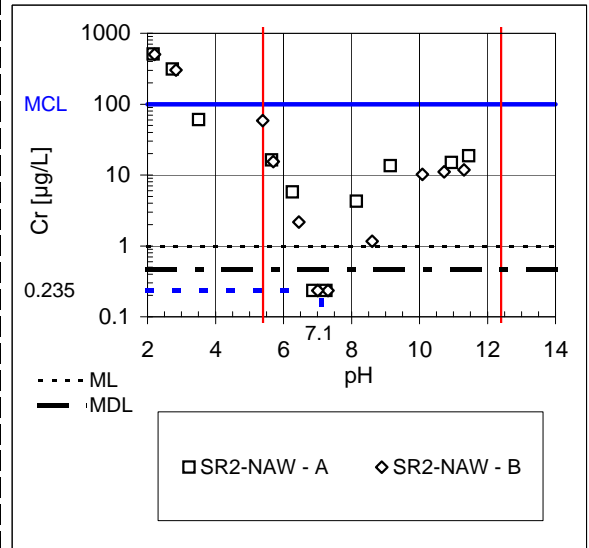
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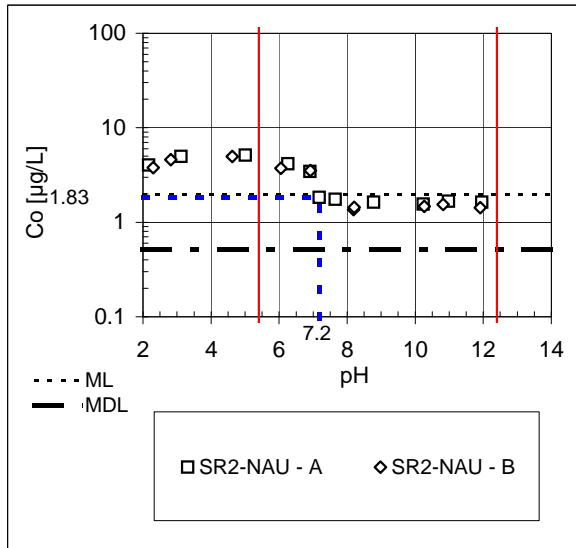
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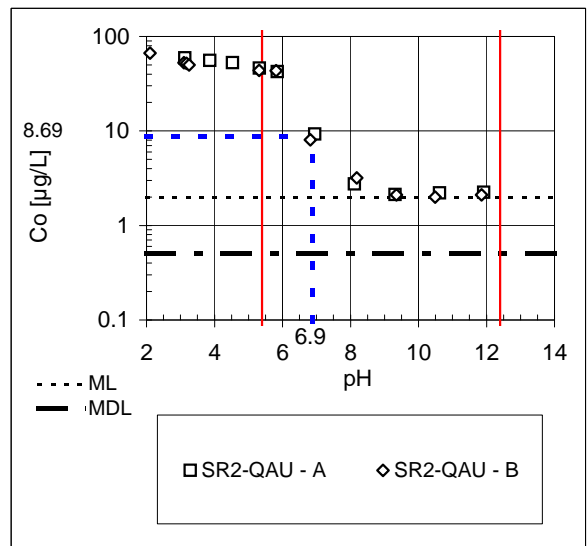
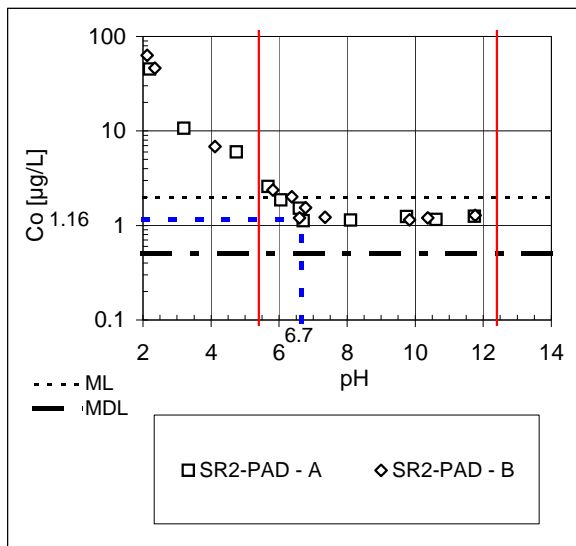
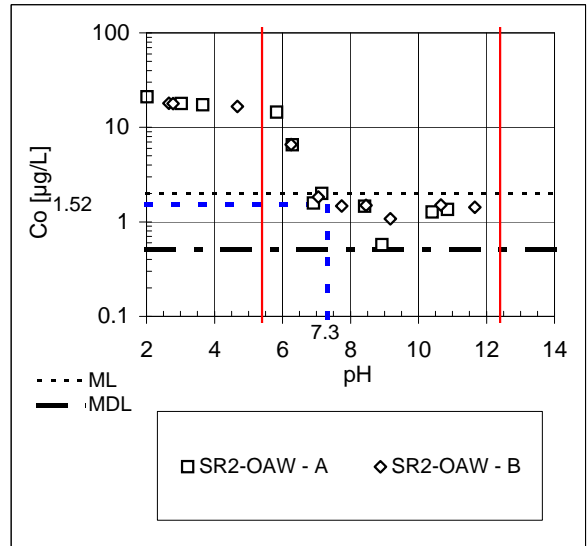
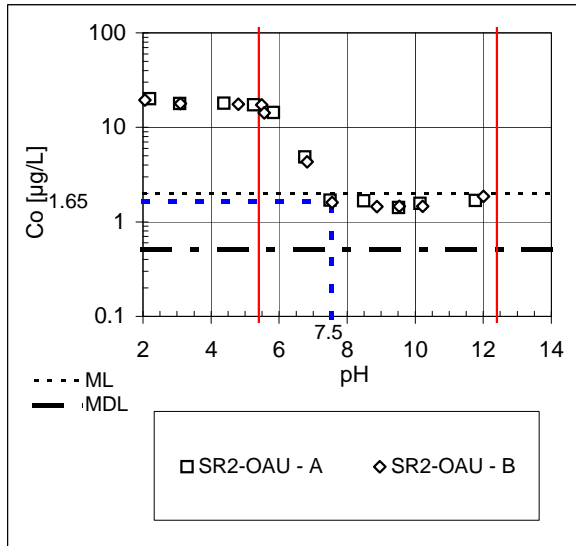
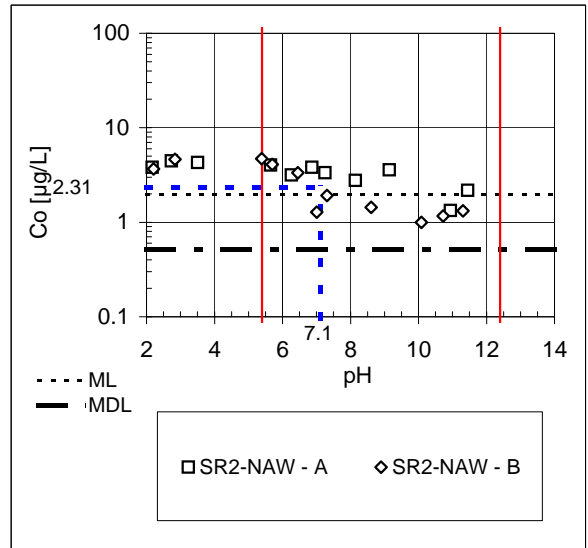
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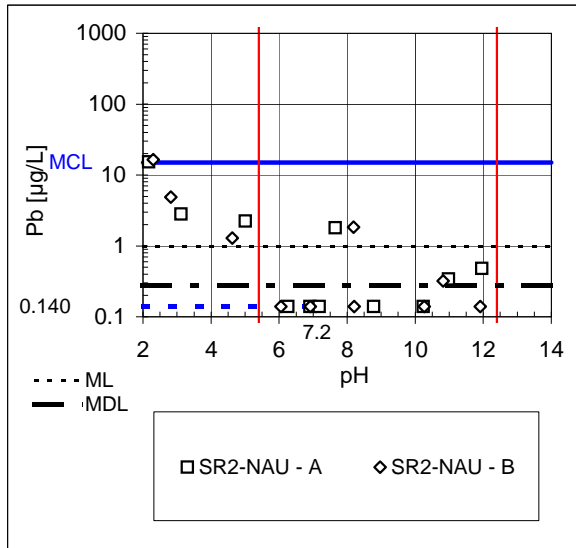
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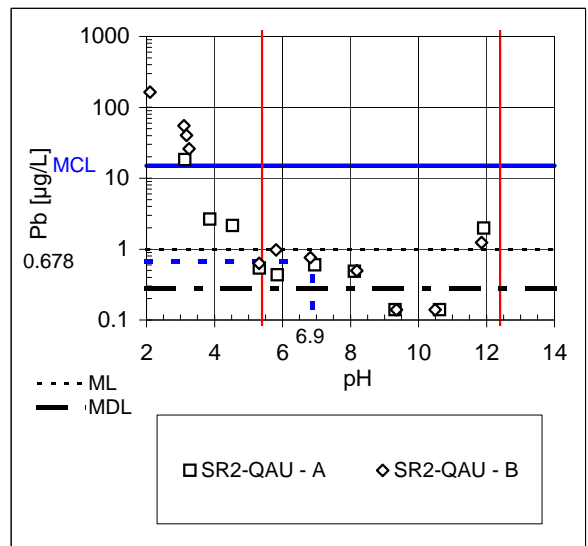
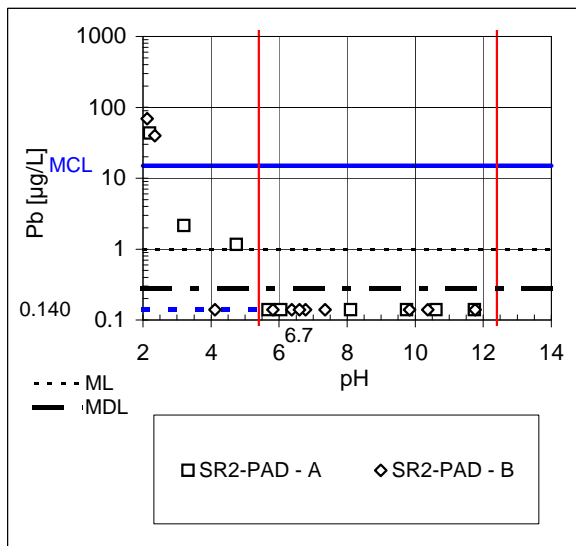
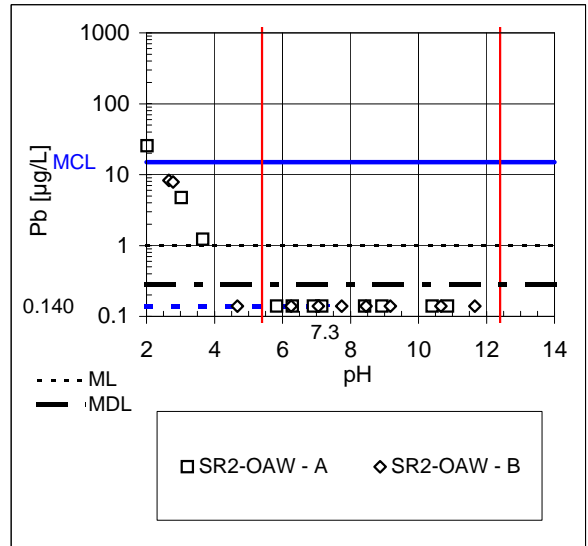
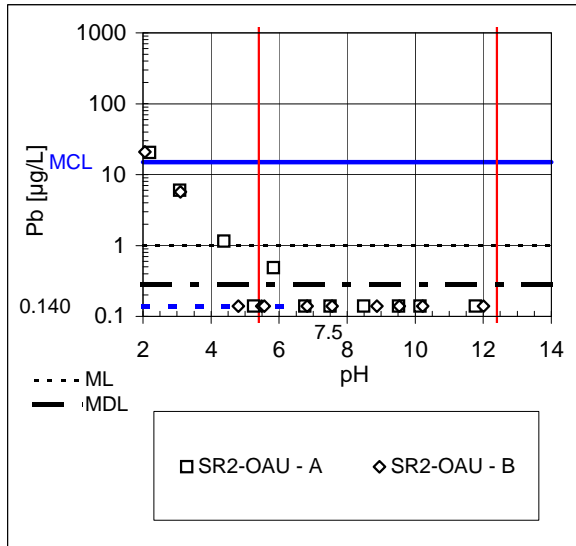
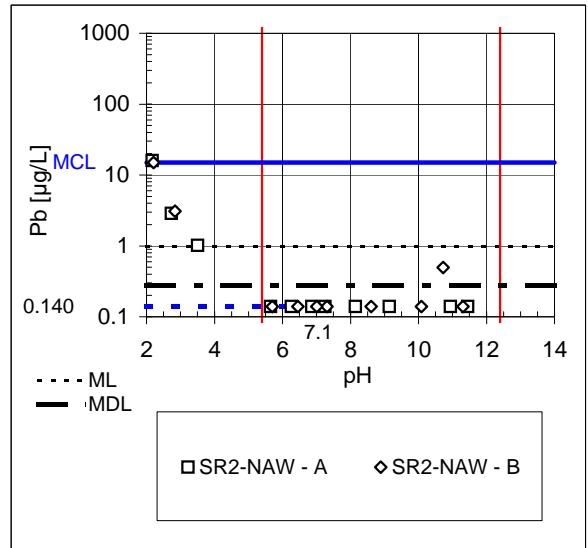
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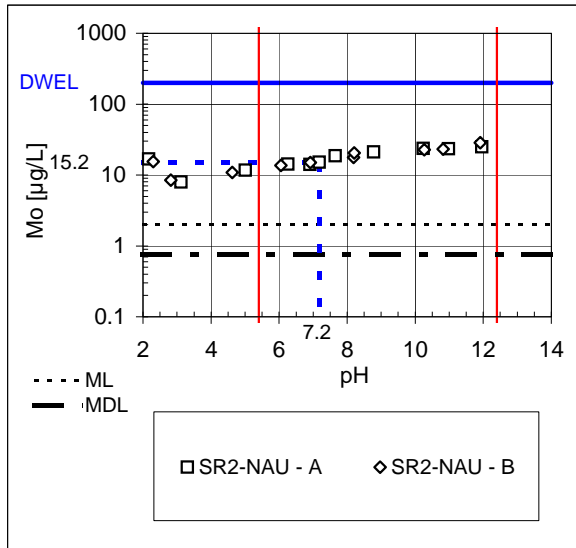
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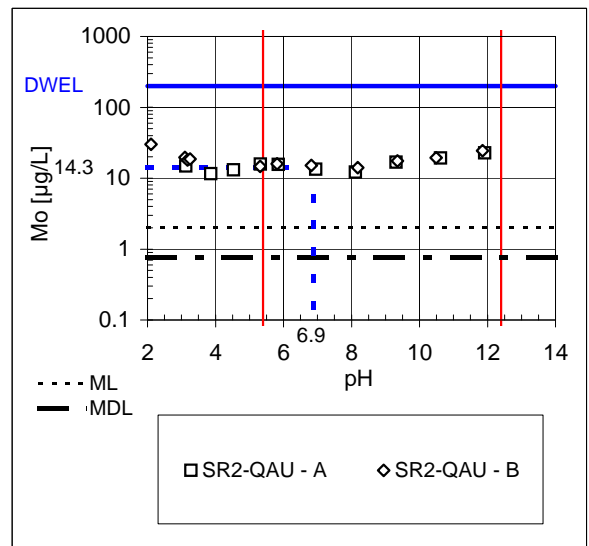
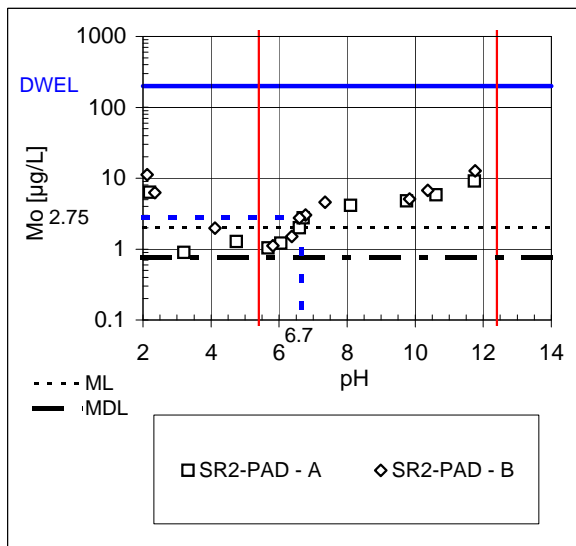
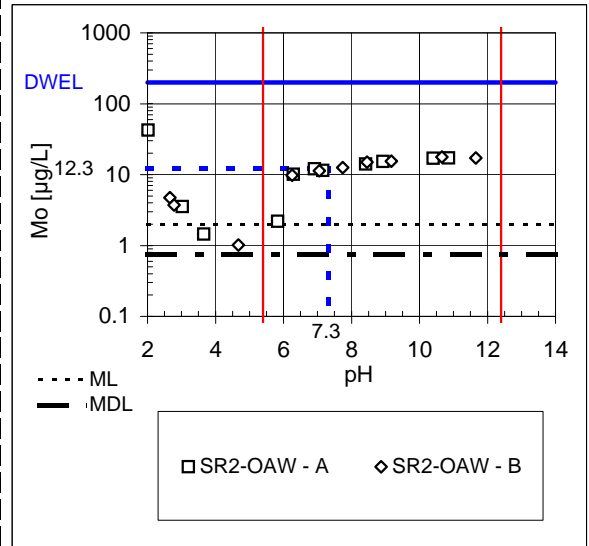
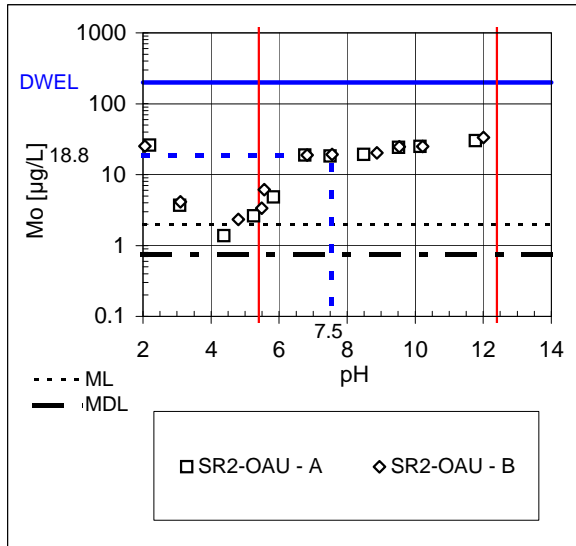
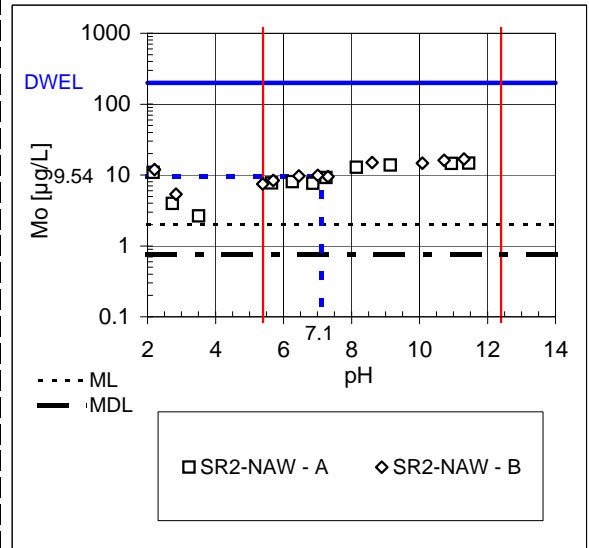
Gyp-W



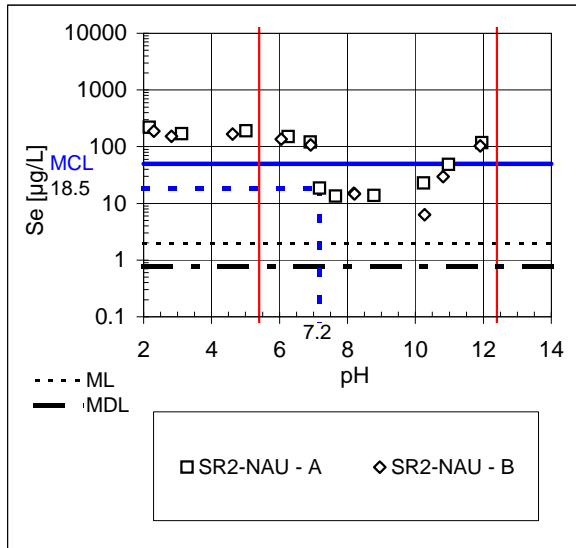
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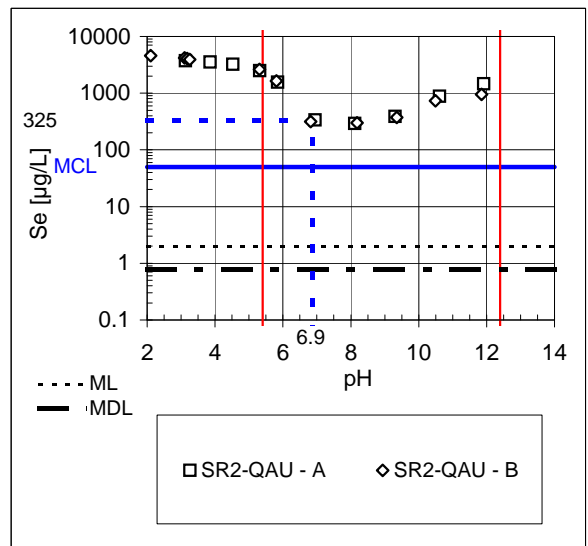
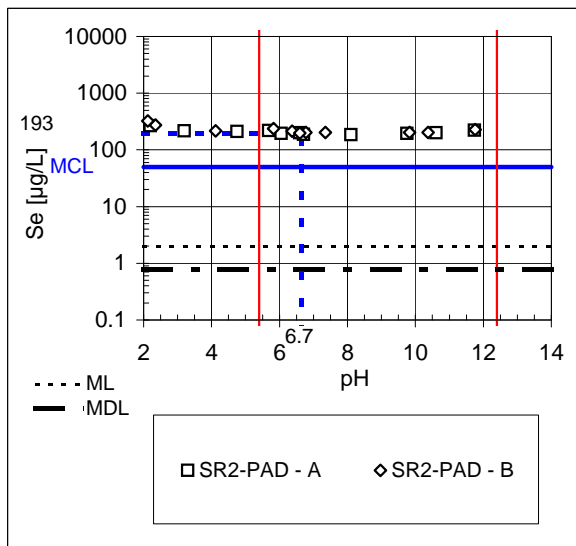
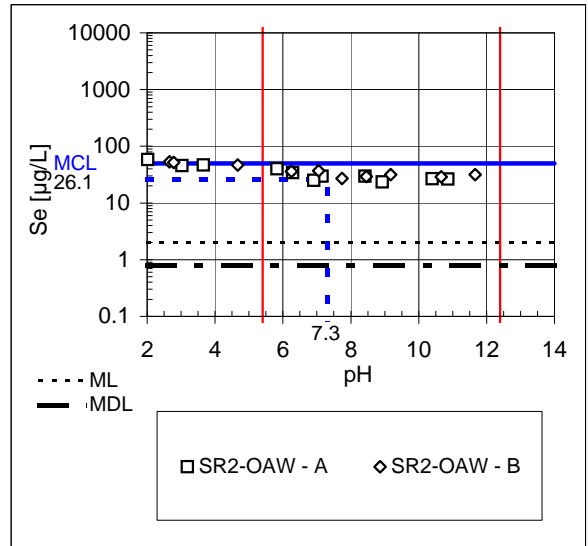
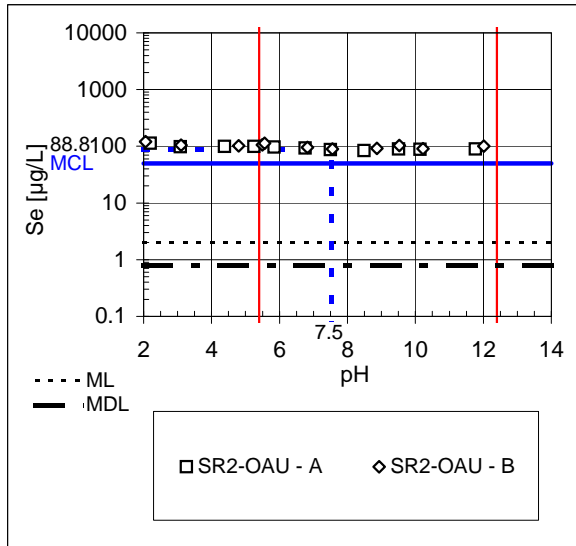
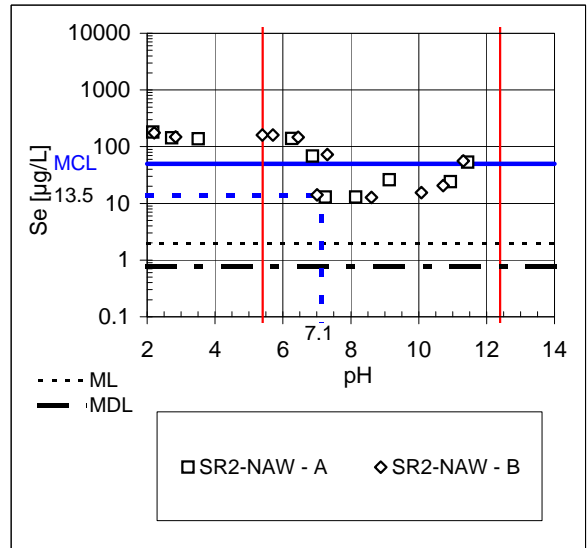
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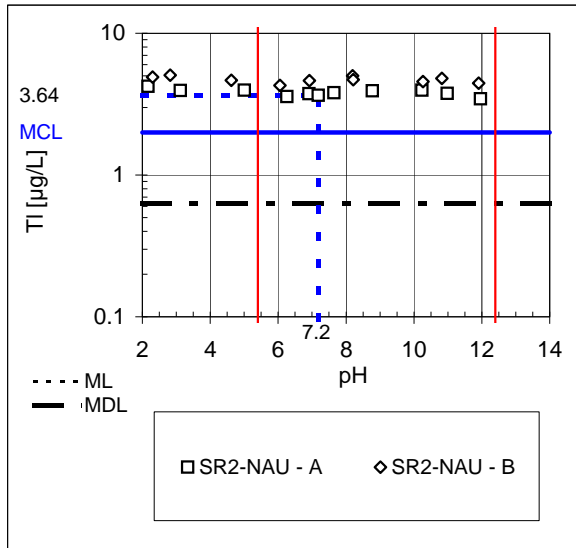
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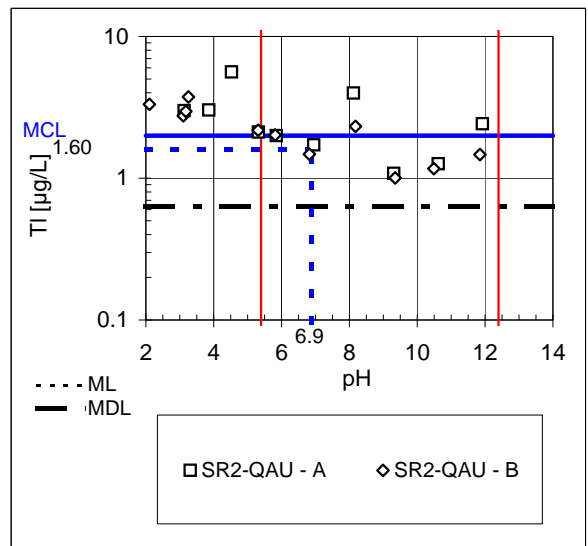
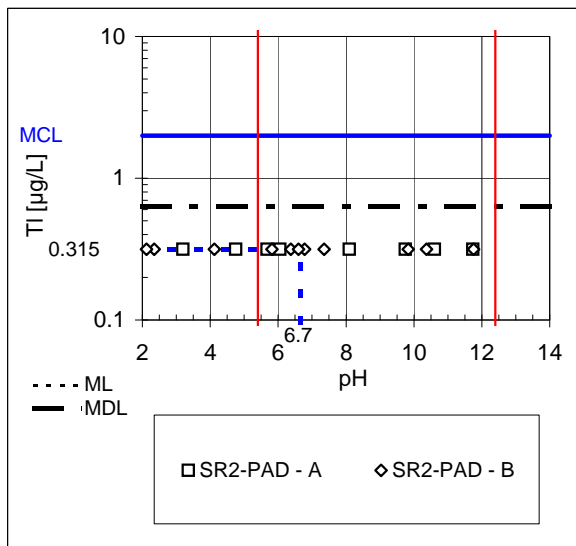
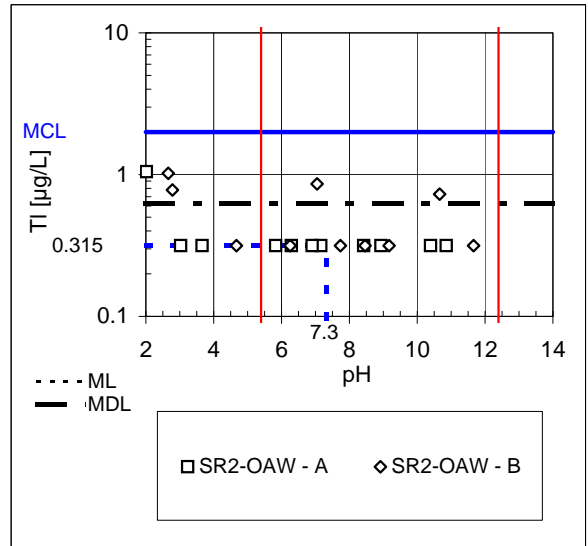
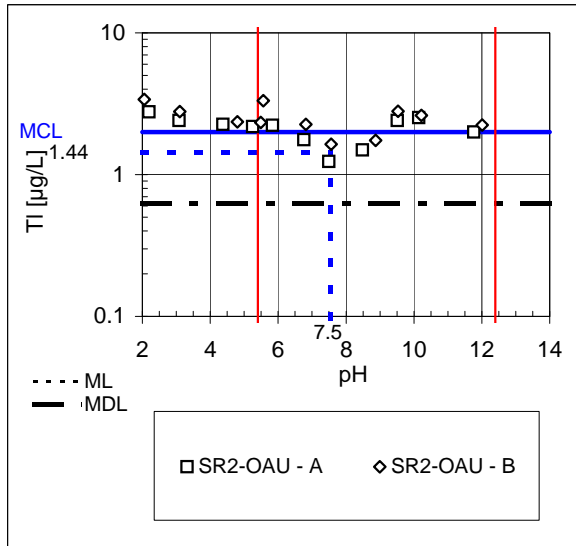
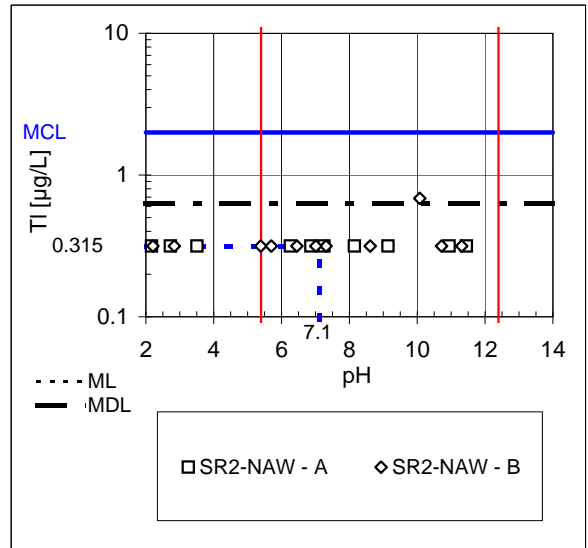
Gyp-W



Gyp-U



Gyp-W



Scrubber Sludge (ScS) Comparisons

Facility A

Coal: low sulfur bituminous

APC: NO+SNCR+FF

CGD
(SNCR Off)

AGD
(SNCR On)

Facility B

Coal: low sulfur bituminous

APC: NO+SCR+ESP(CS) [Mg lime]

DGD
(SCR Off)

BGD
(SCR On)

Facility K

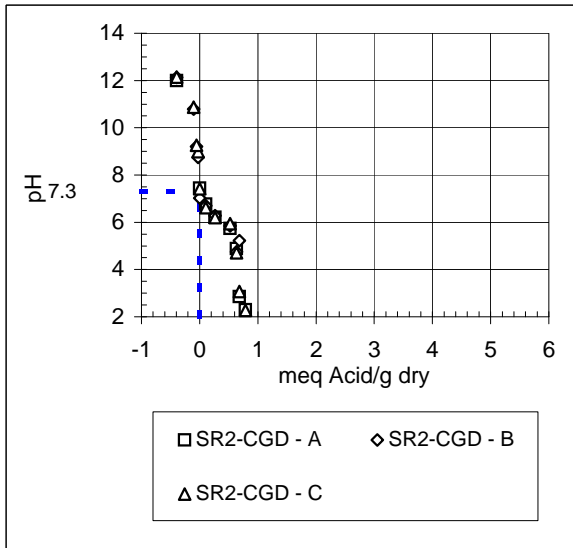
Coal: sub- bituminous

APC: NO+SCR+ESP(CS) [Mg lime]

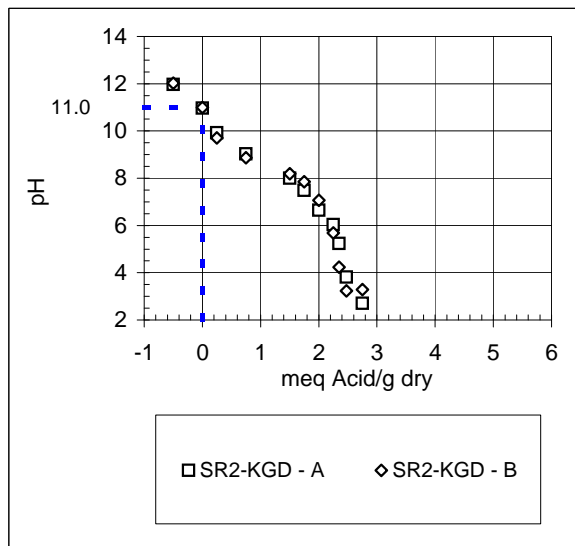
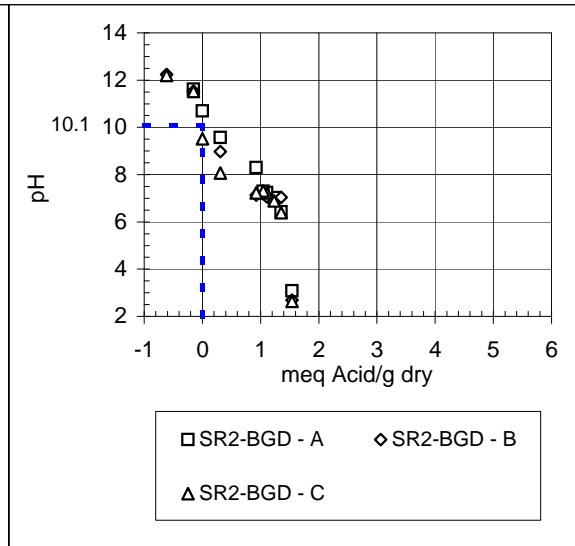
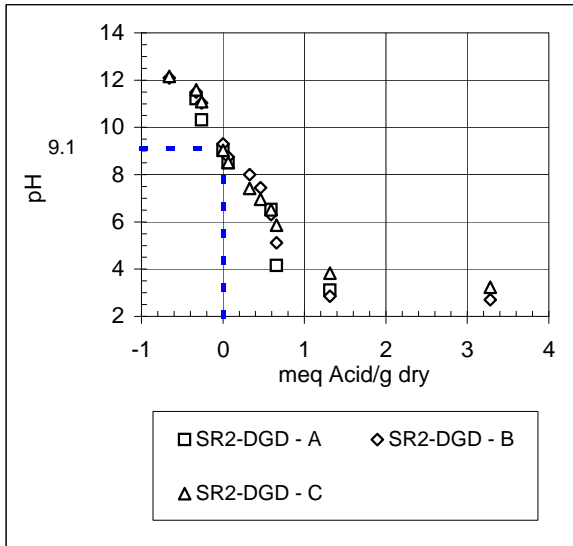
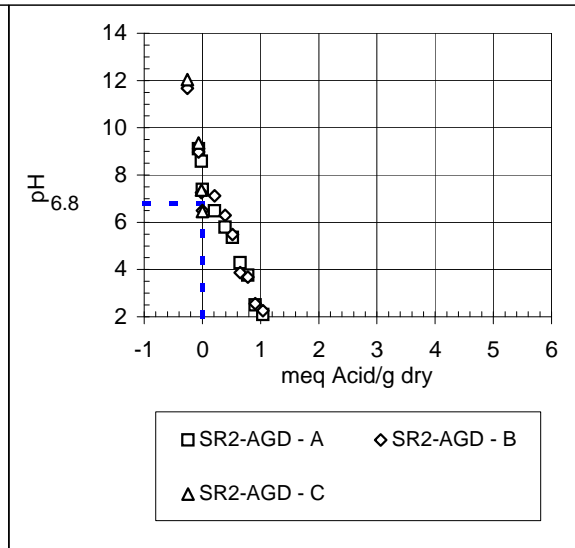
KGD
(SCR On)

Scrubber Sludge Comparisons

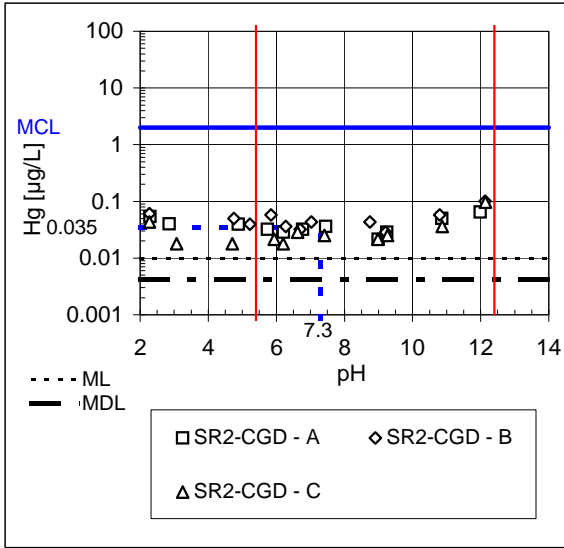
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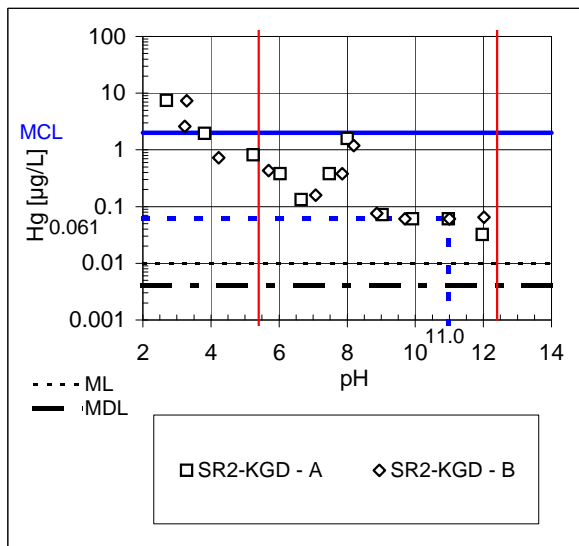
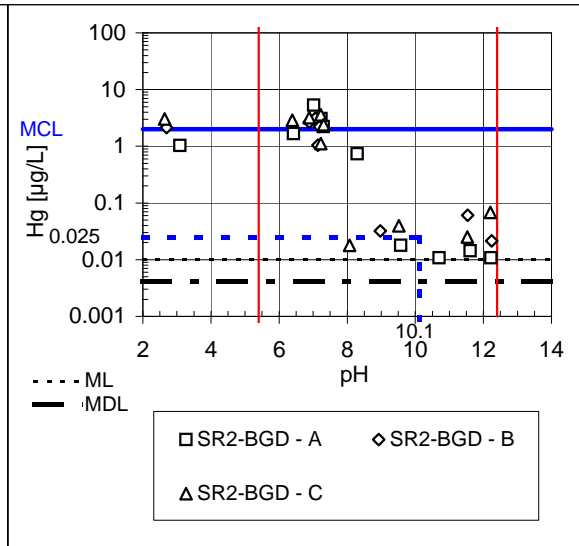
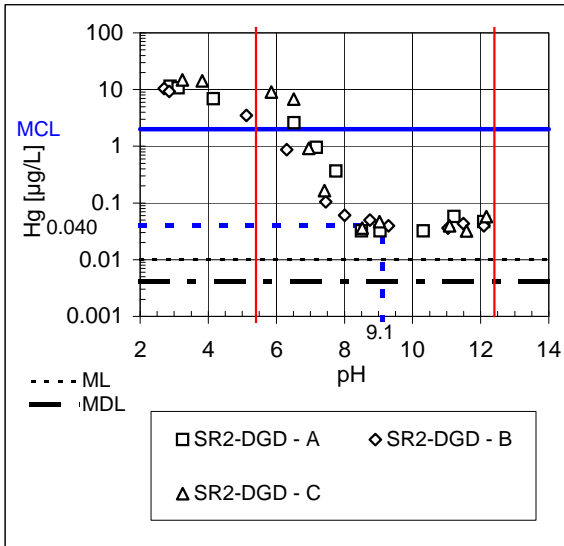
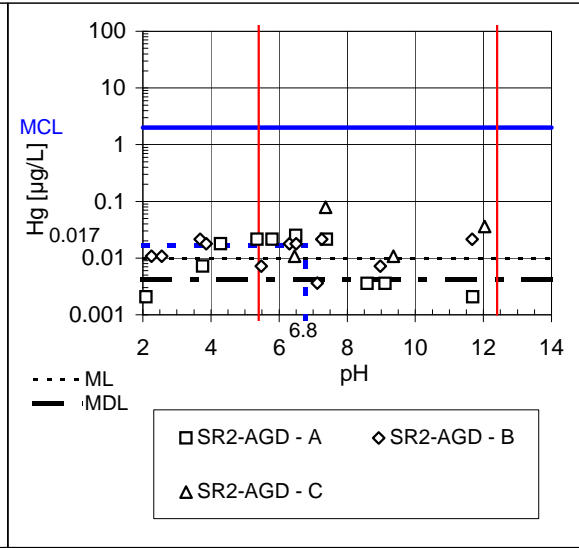
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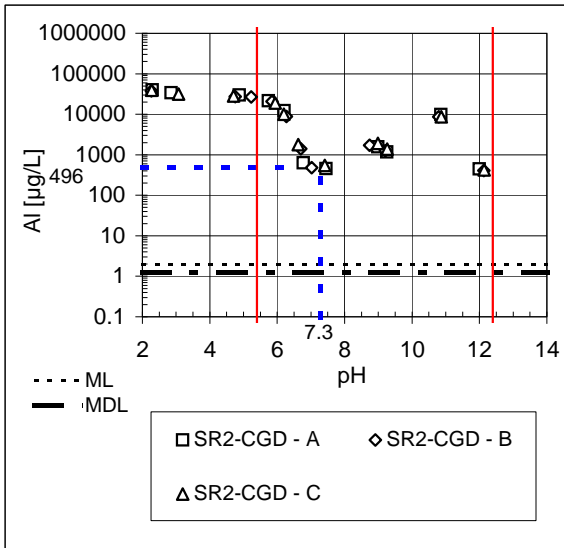
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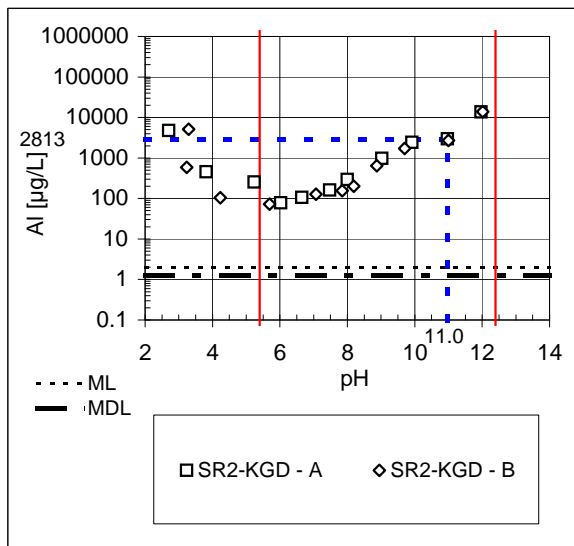
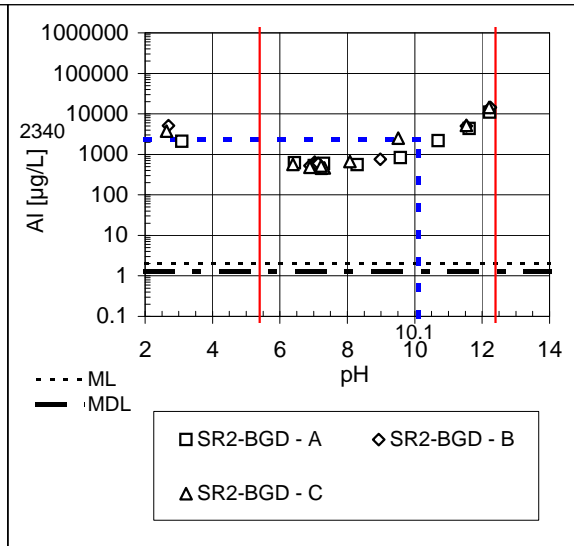
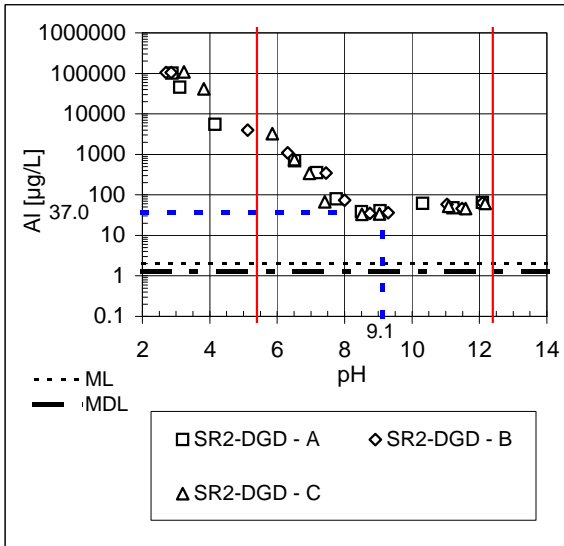
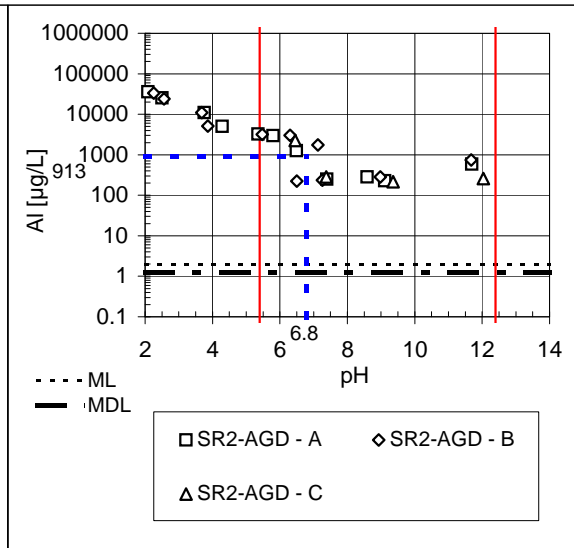
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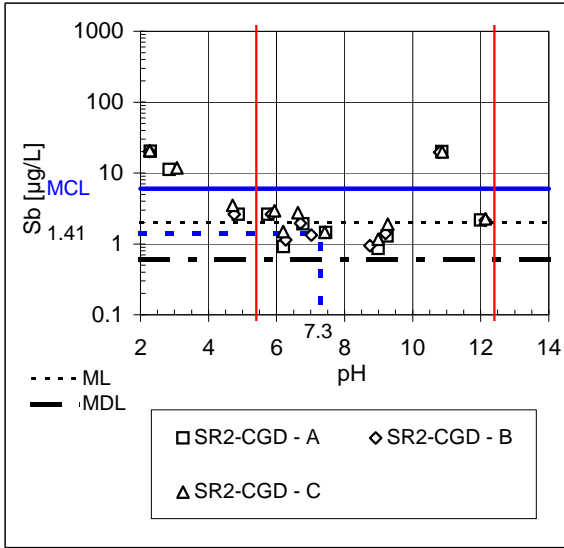
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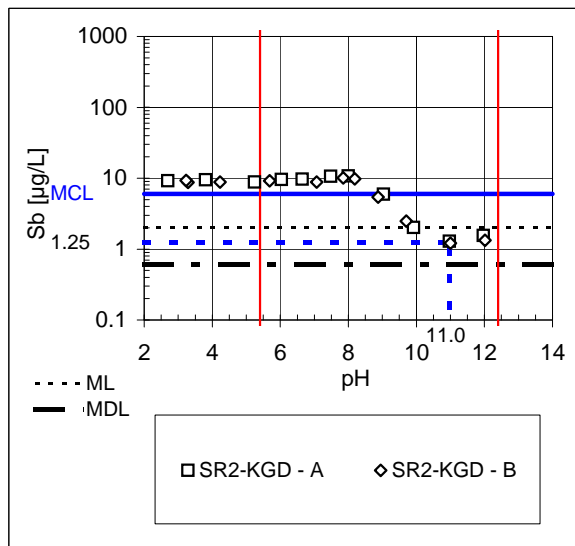
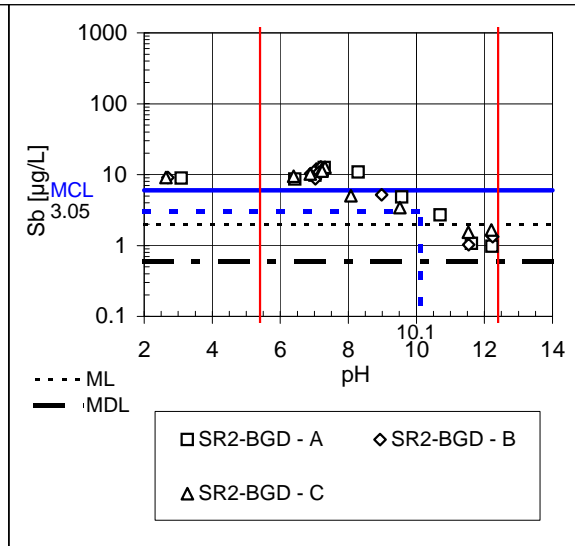
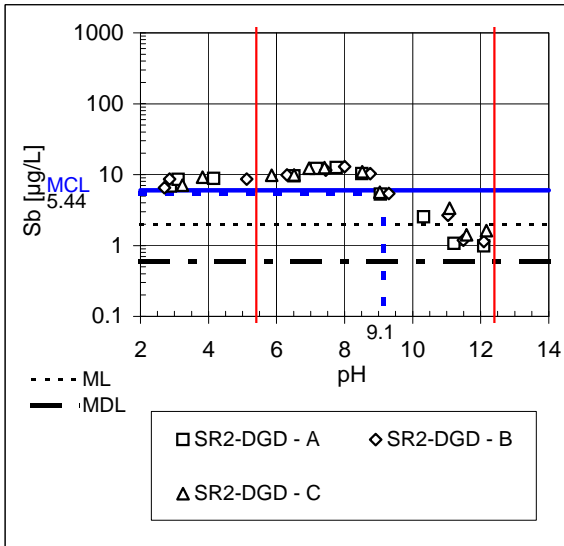
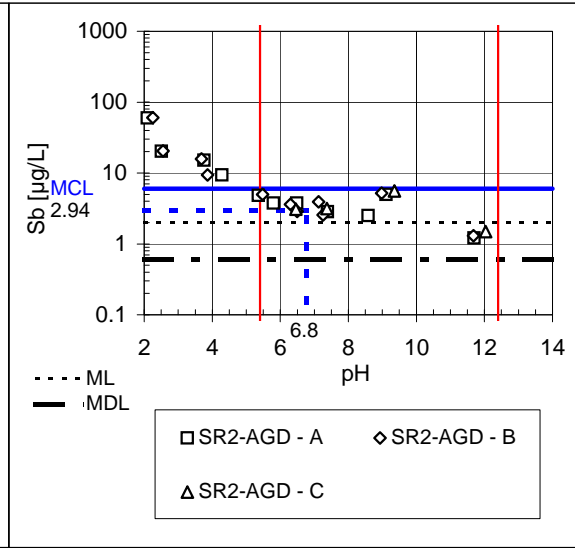
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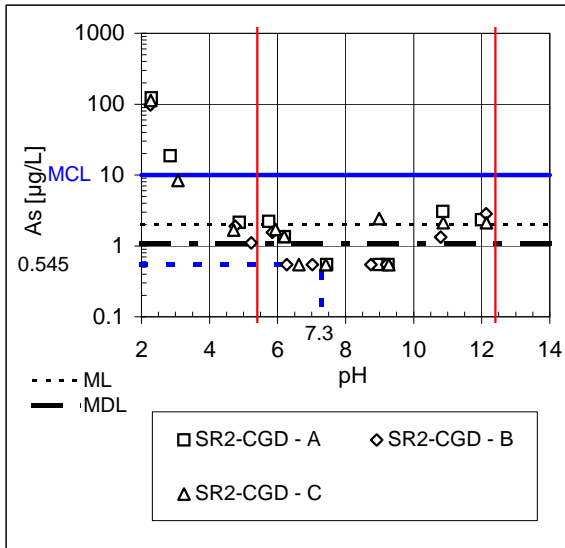
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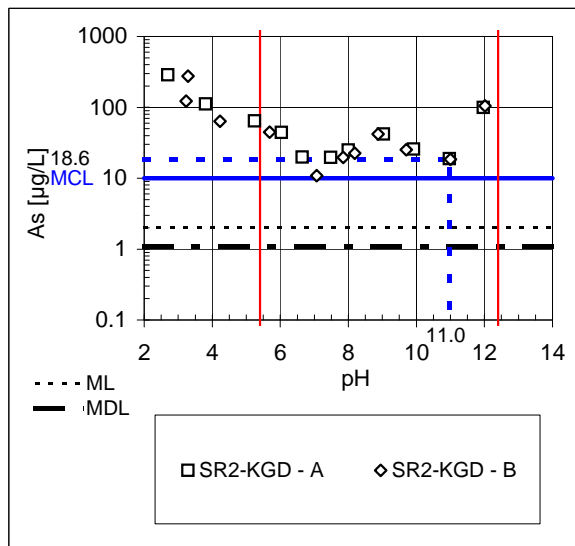
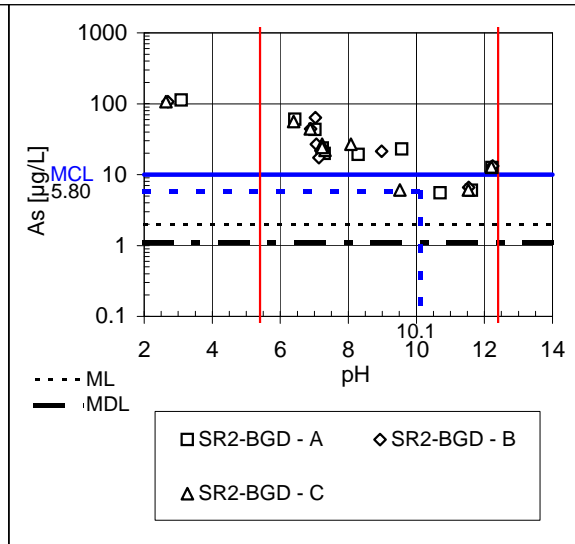
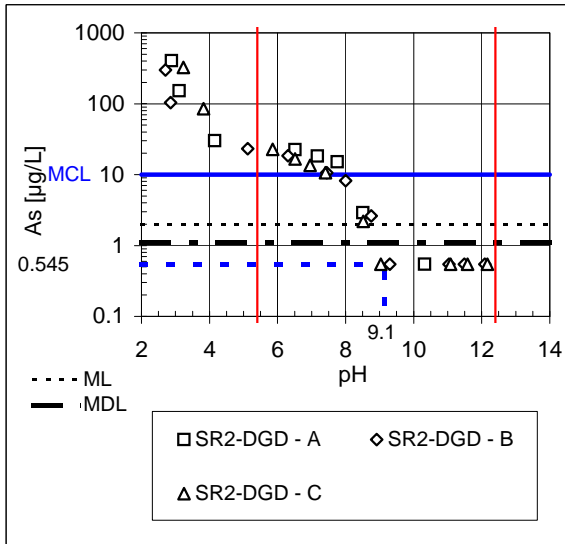
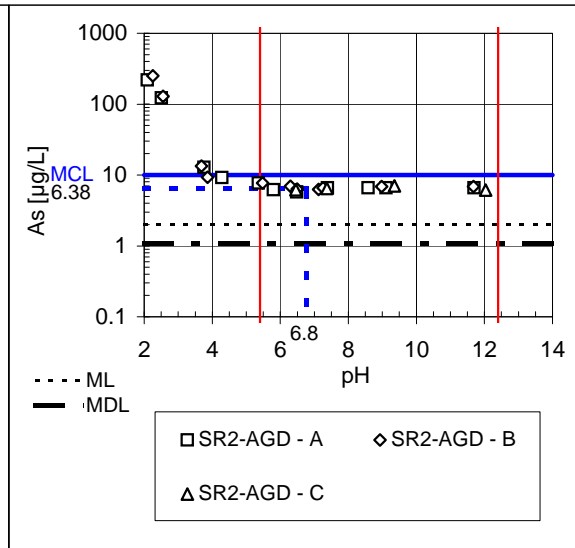
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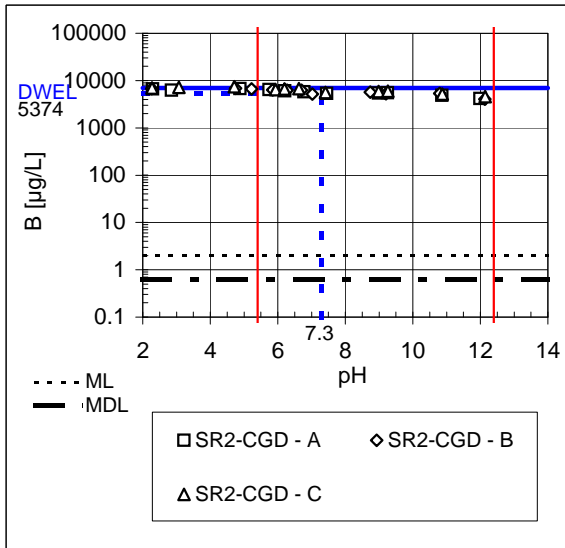
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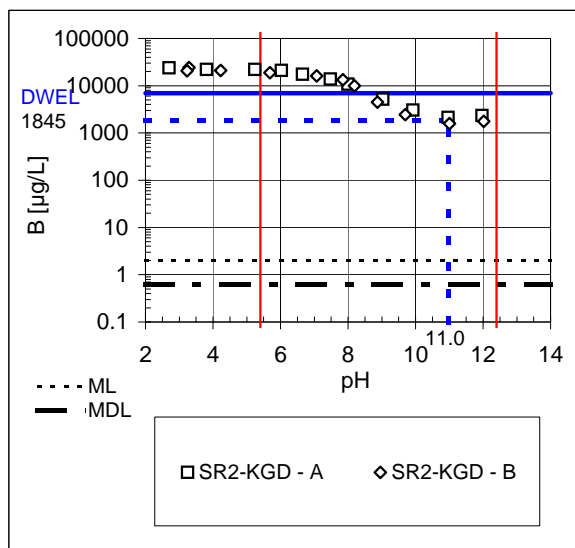
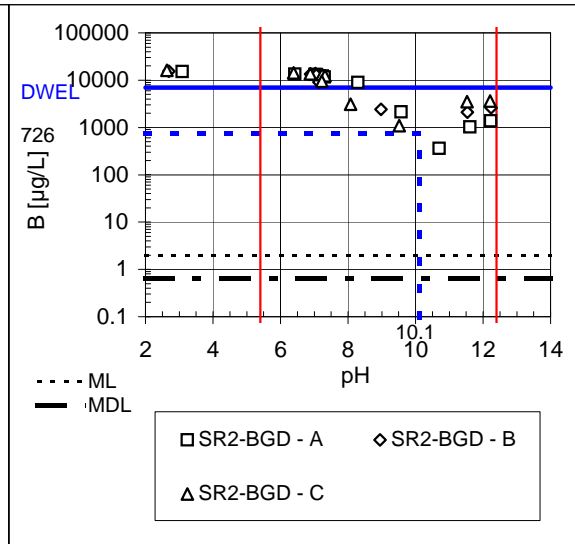
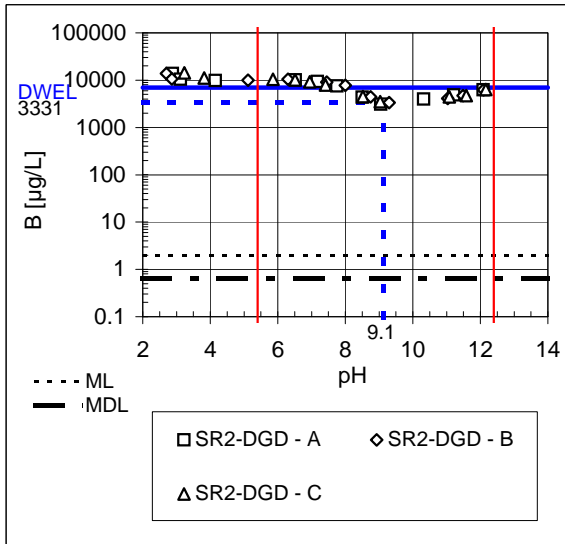
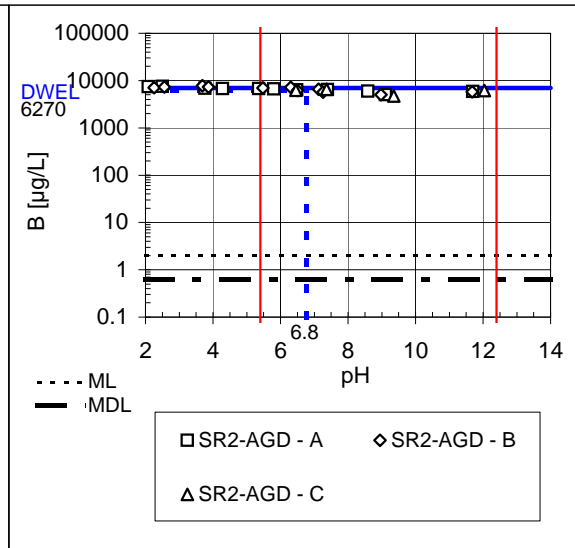
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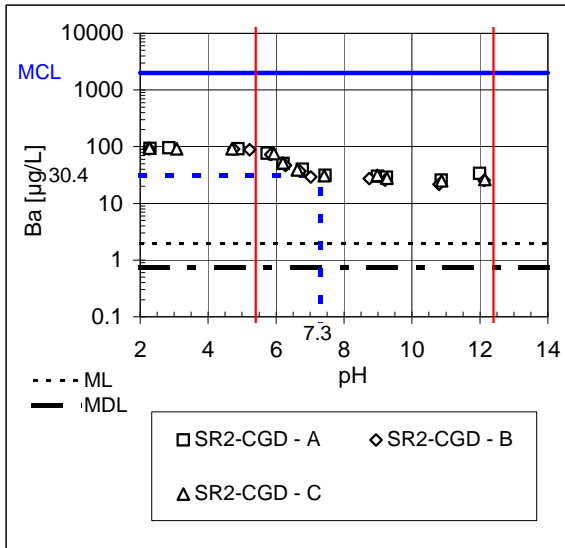
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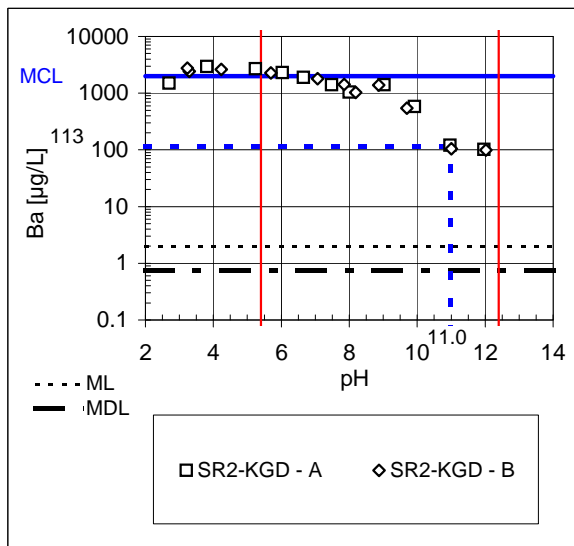
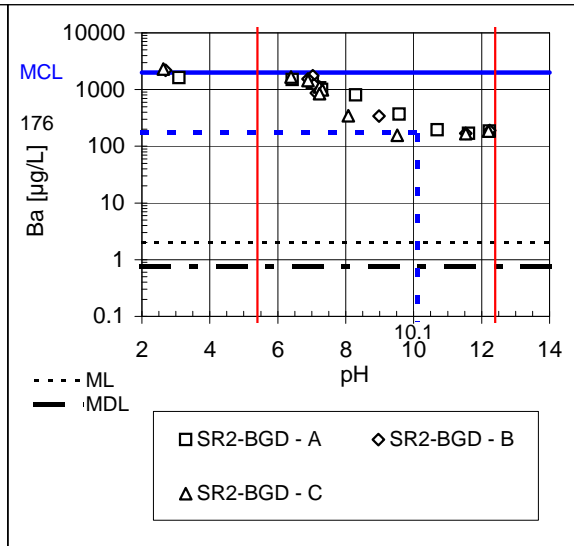
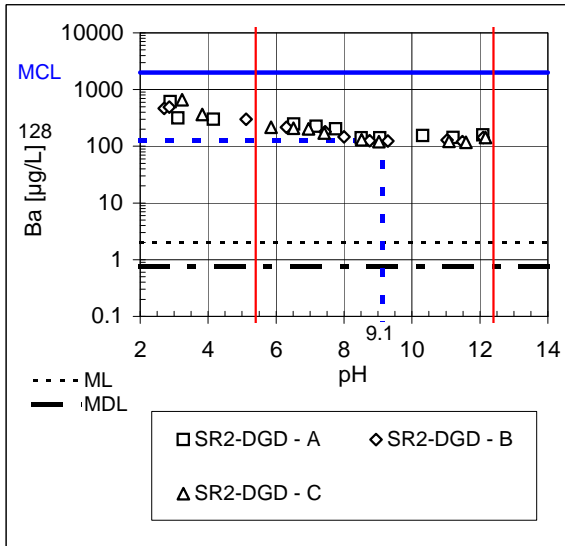
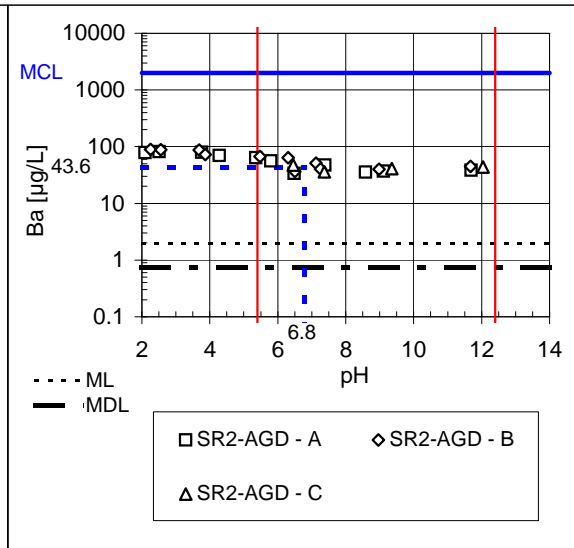
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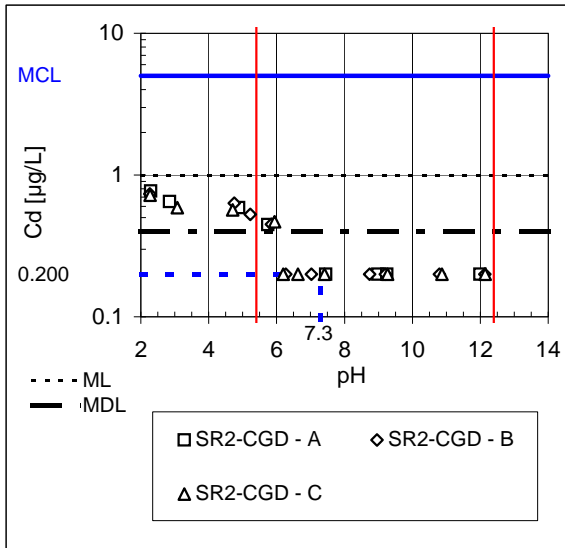
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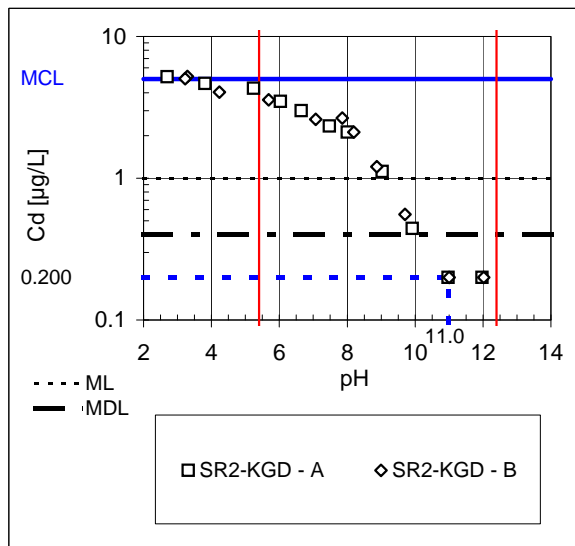
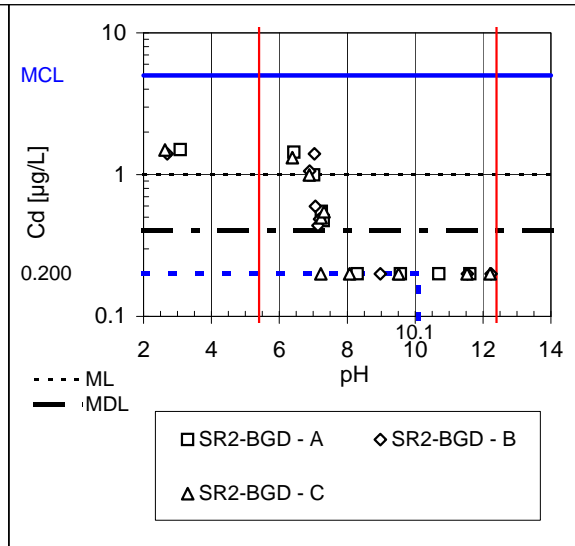
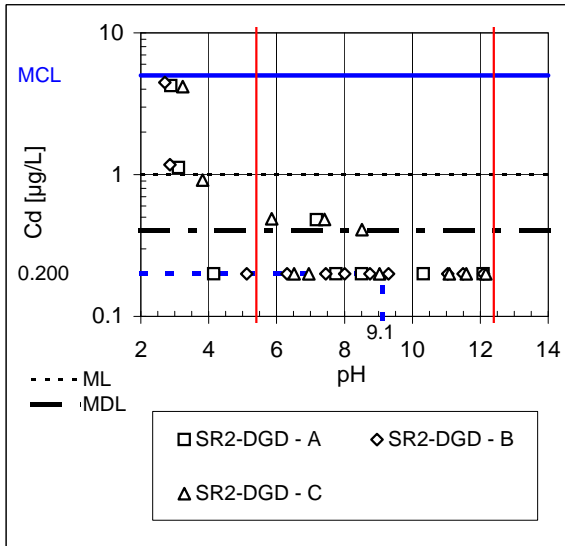
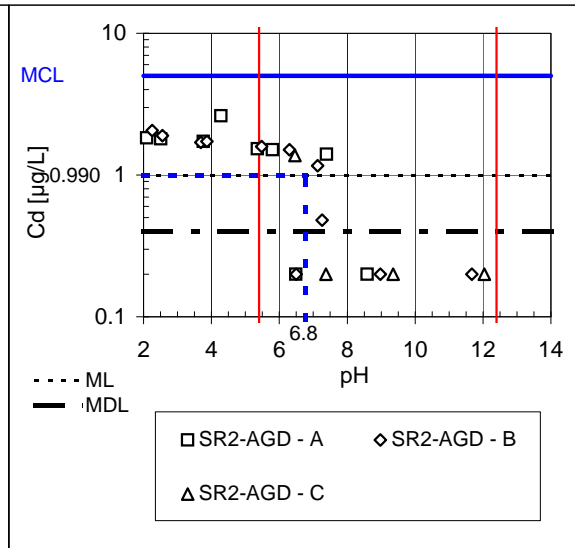
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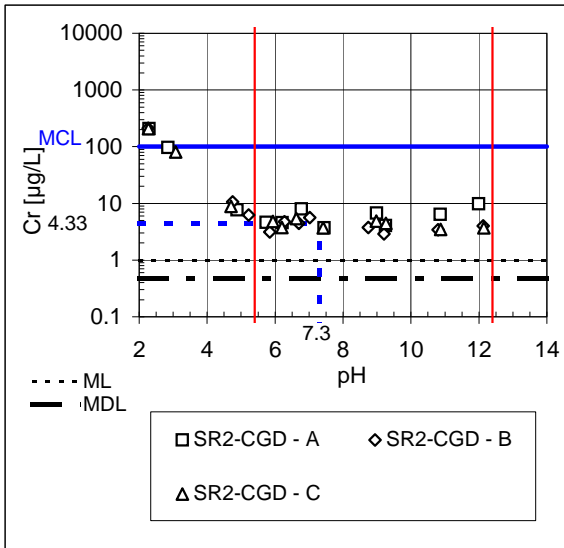
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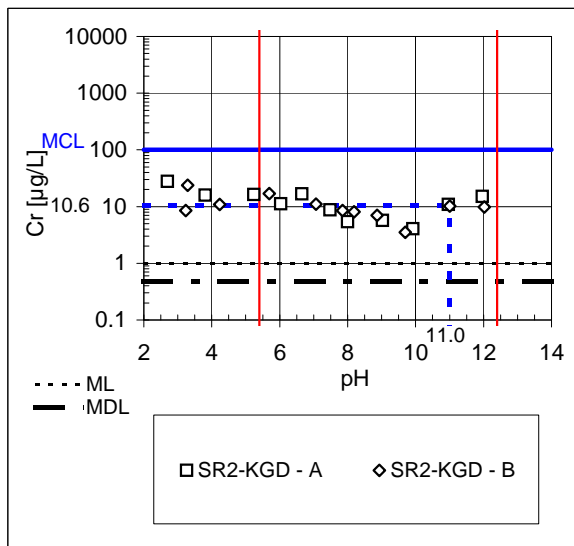
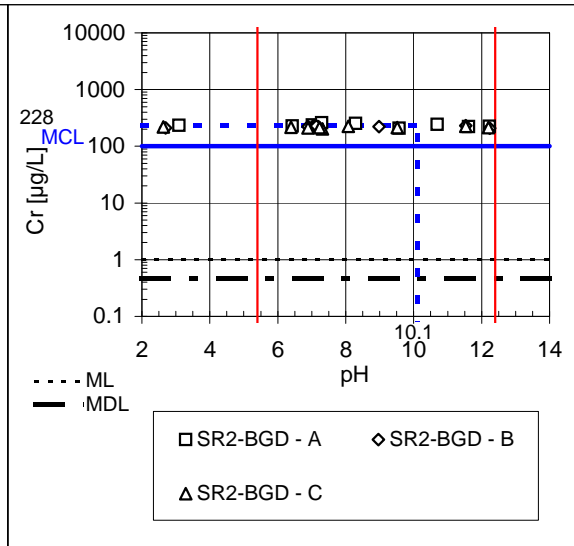
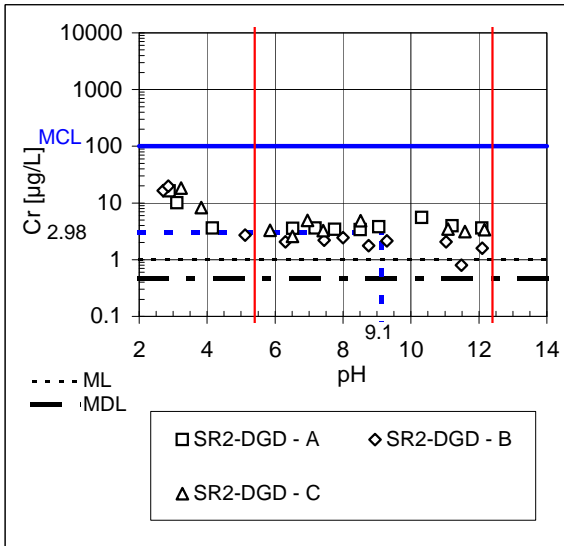
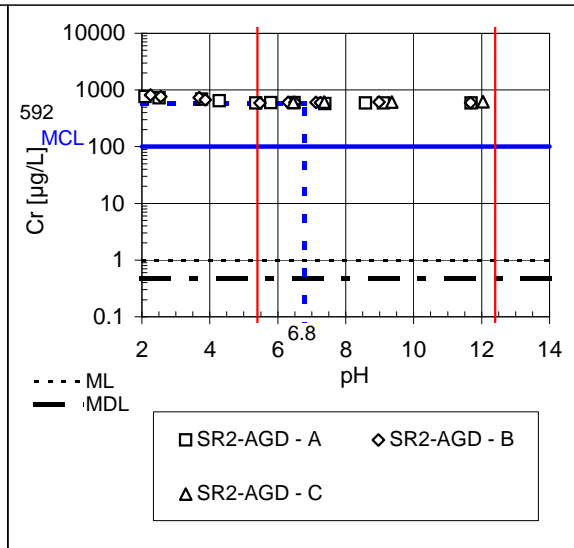
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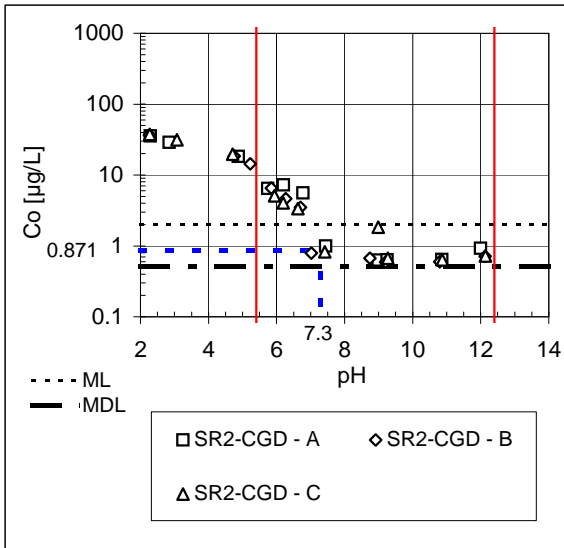
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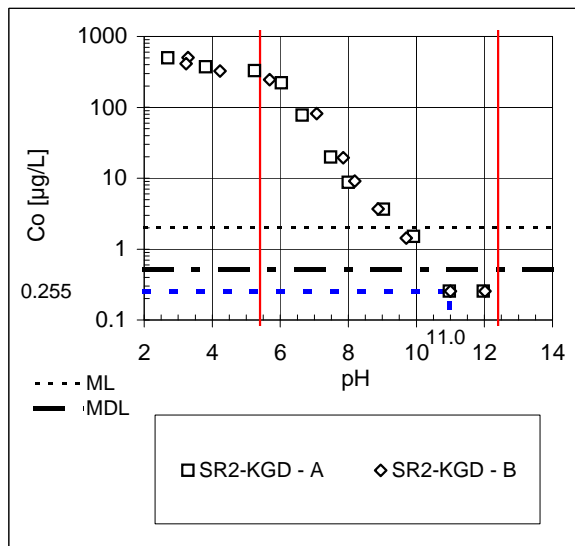
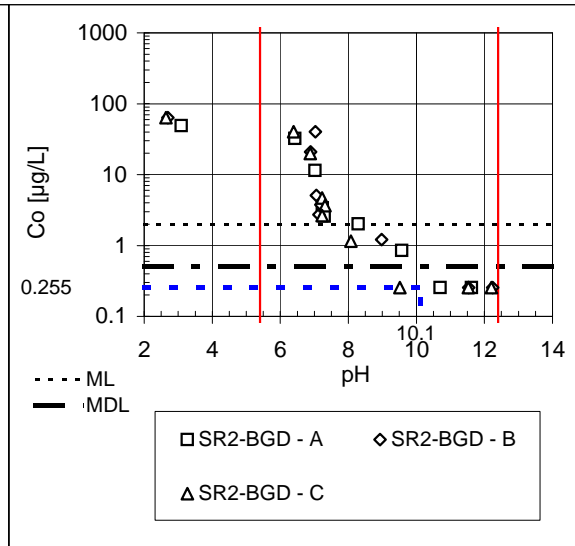
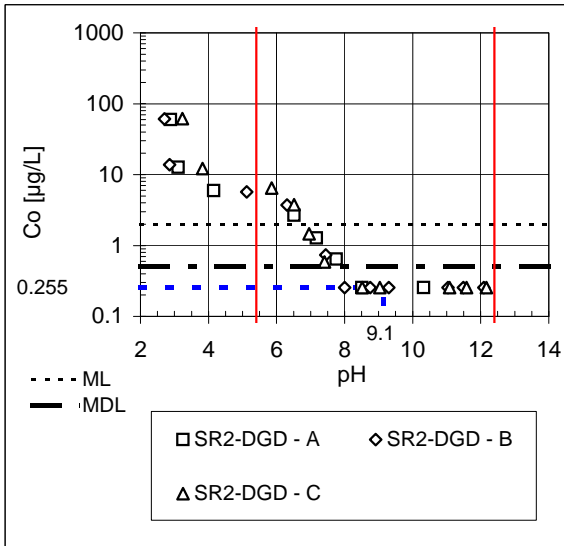
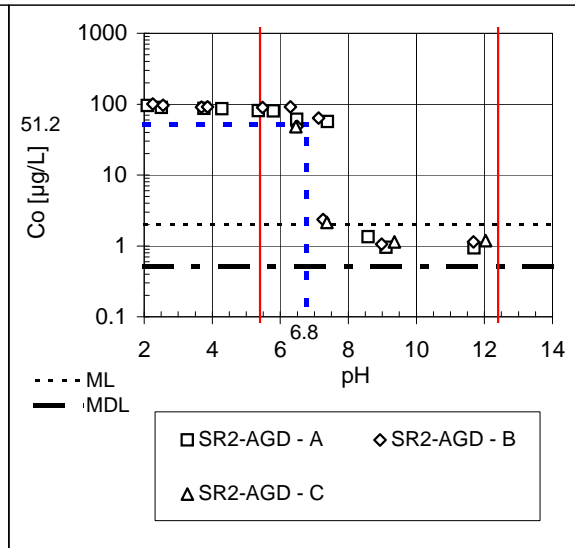
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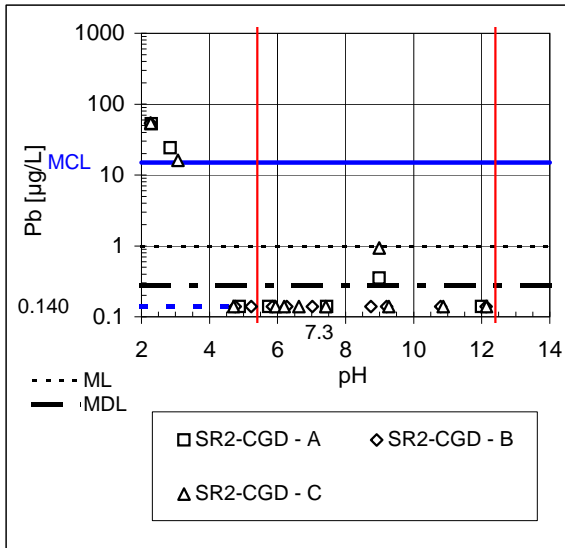
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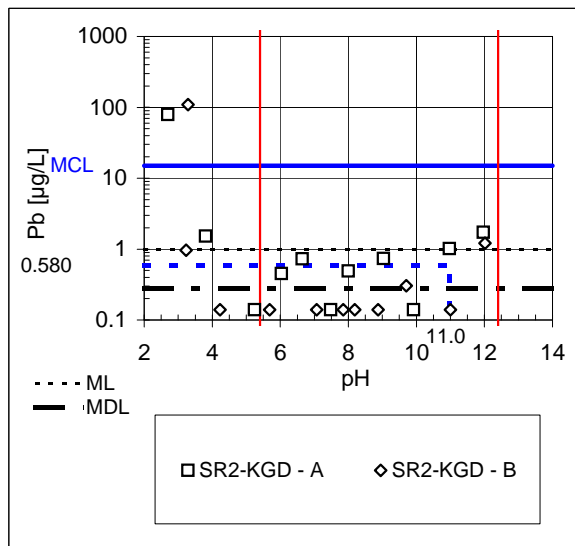
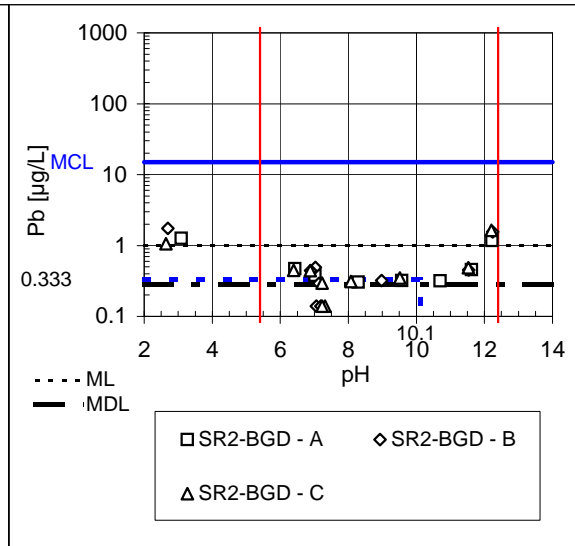
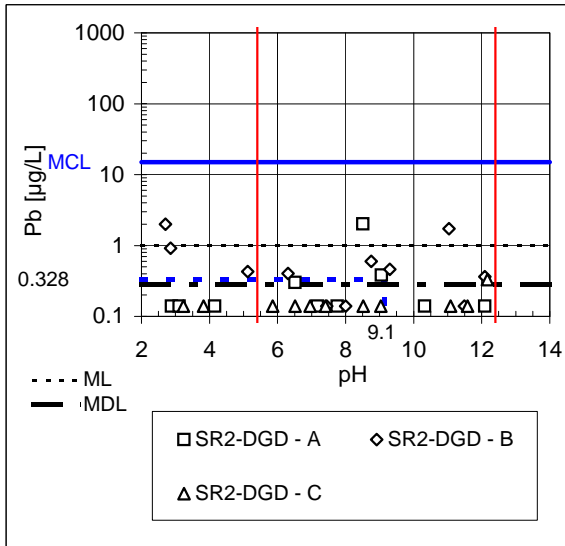
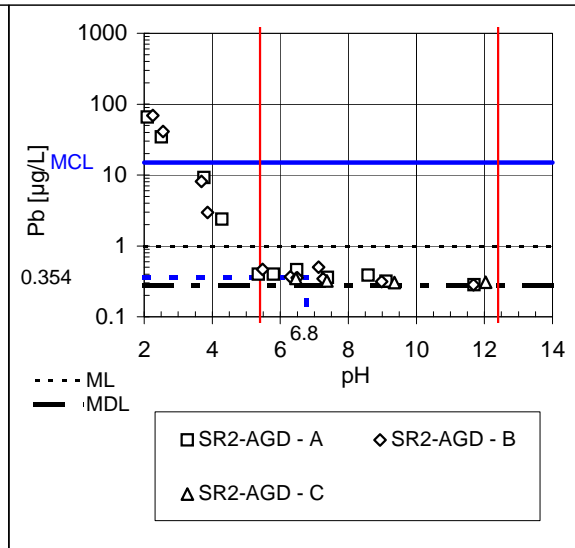
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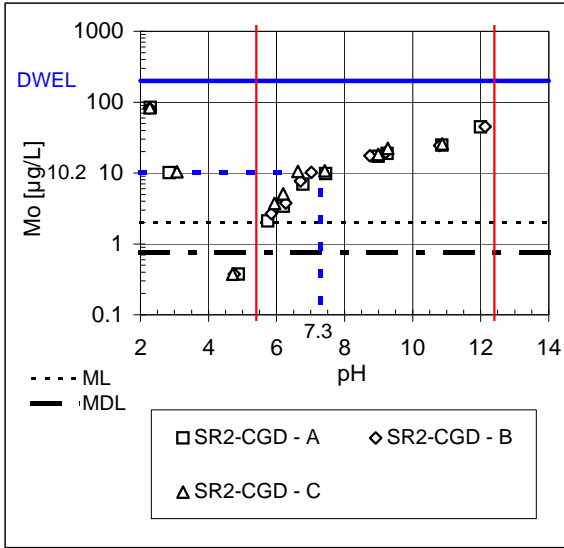
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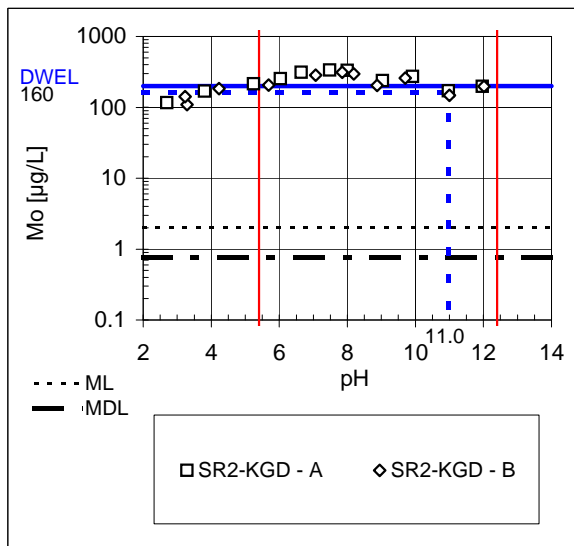
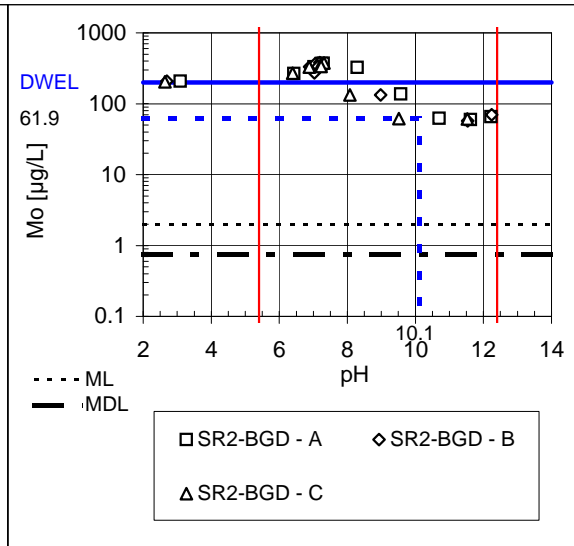
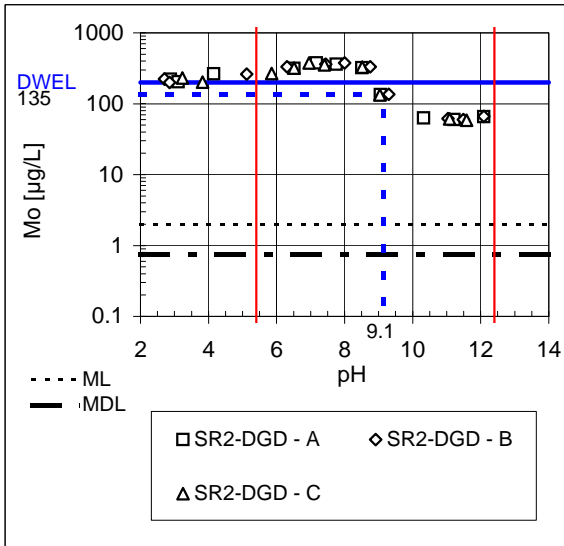
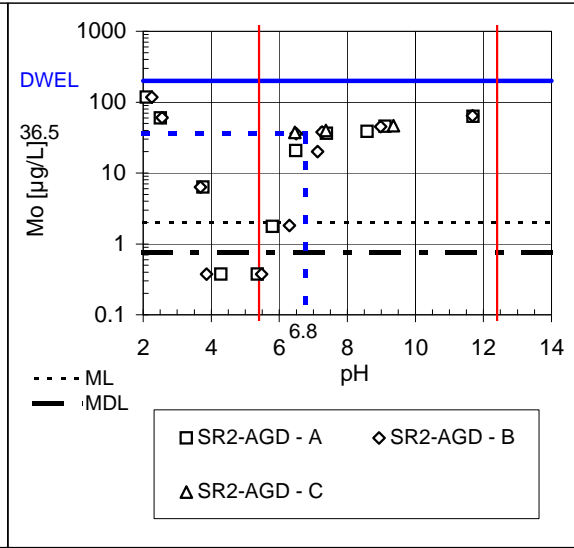
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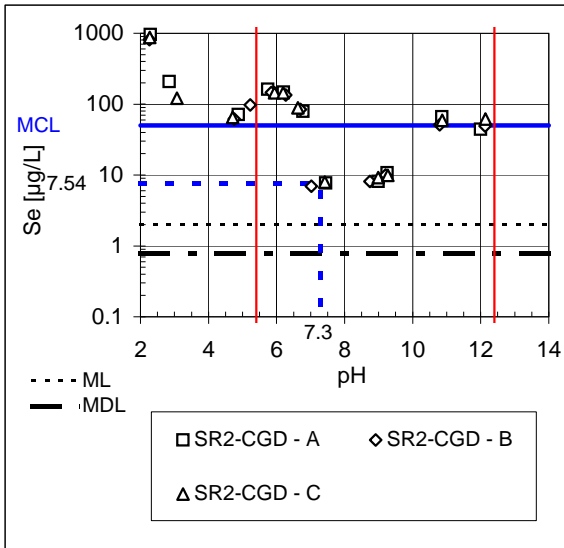
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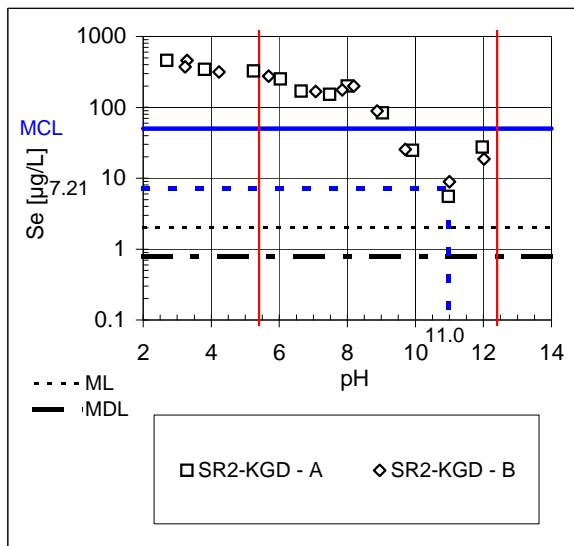
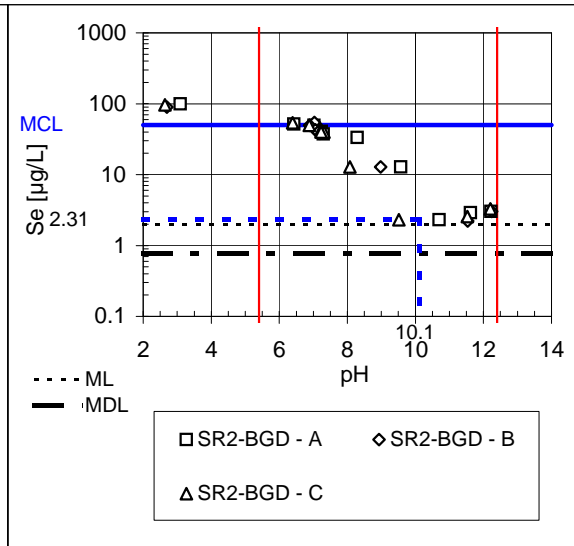
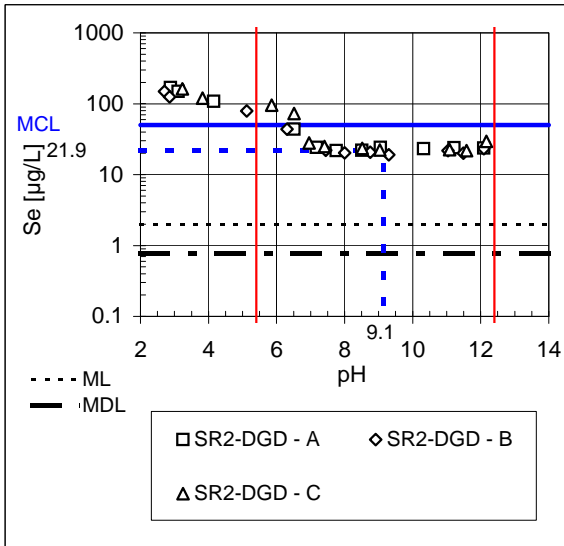
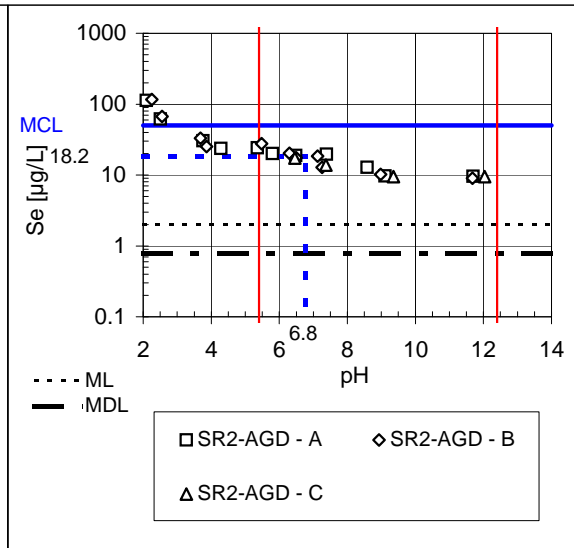
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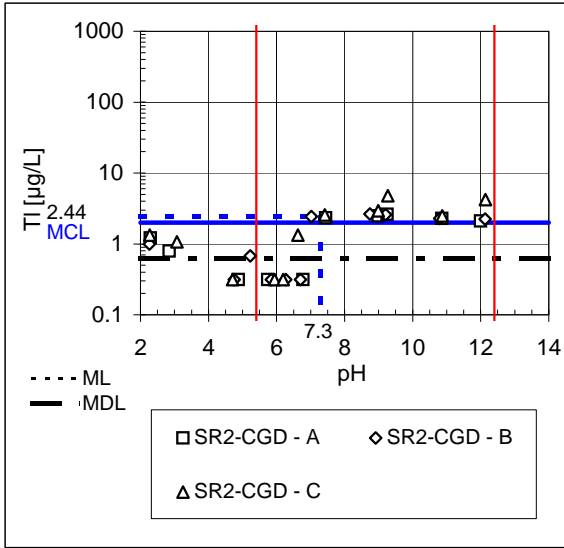
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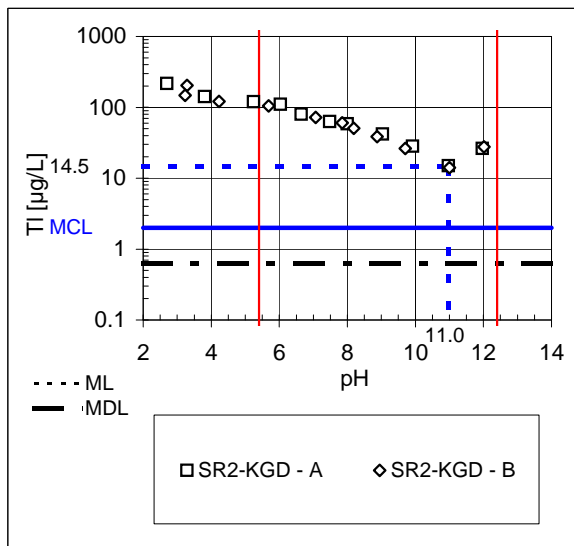
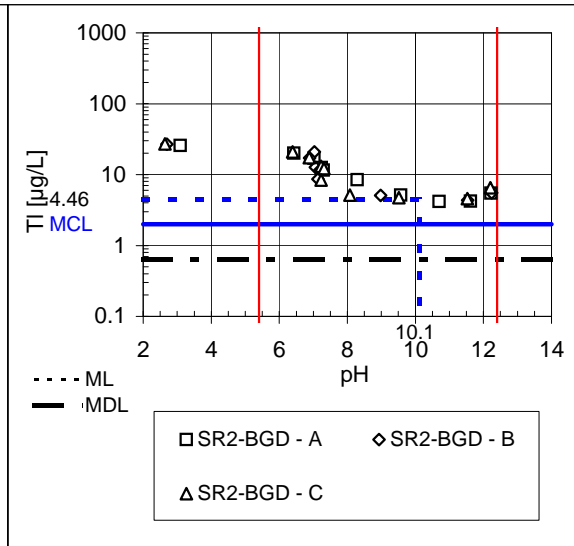
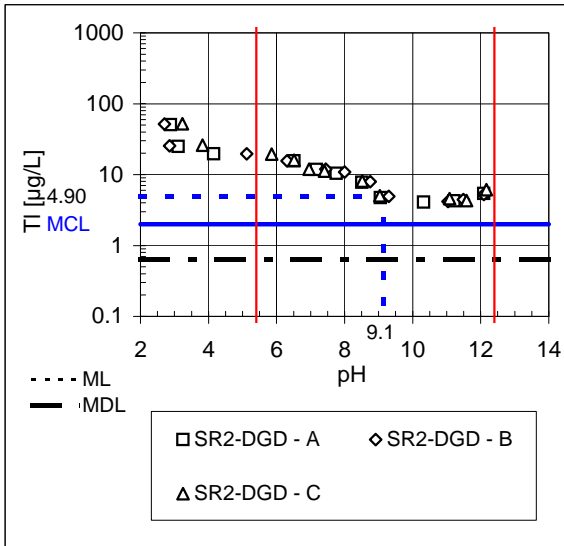
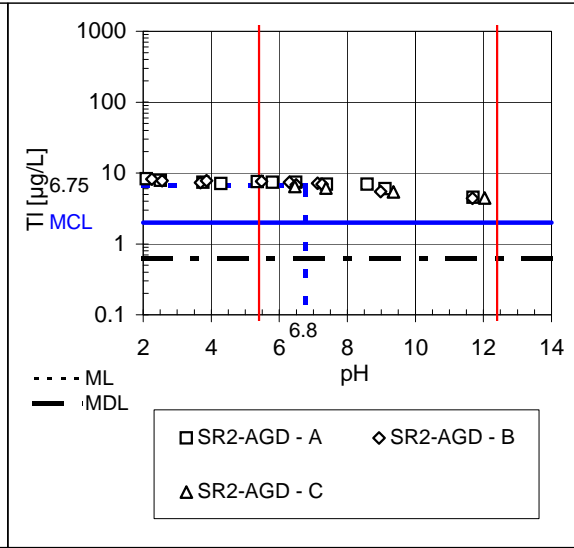
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Off



On



Fixated Scrubber Sludge (FSS, FSSL) Comparisons

FSS: Fly Ash + Scrubber Sludge (FA+ScS)

Facility A (FSS)

Coal: low sulfur bituminous

APC: NO+SNCR+FF

CCC
(SNCR Off)

ACC
(SNCR On)

page break

FSSL: Fly Ash + Scrubber Sludge + Lime (FA+ScS+lime)

Facility B (FSSL)

Coal: low sulfur bituminous

APC: NO+SCR+ESP(CS) [Mg lime]

DCC
(SCR Off)

BCC
(SCR On)

Facility K (FSSL)

Coal: sub-bituminous

APC: NO+SCR+ESP(CS) [Mg lime]

KCC
(SCR On)

Facility M (FSSL)

Coal: bituminous

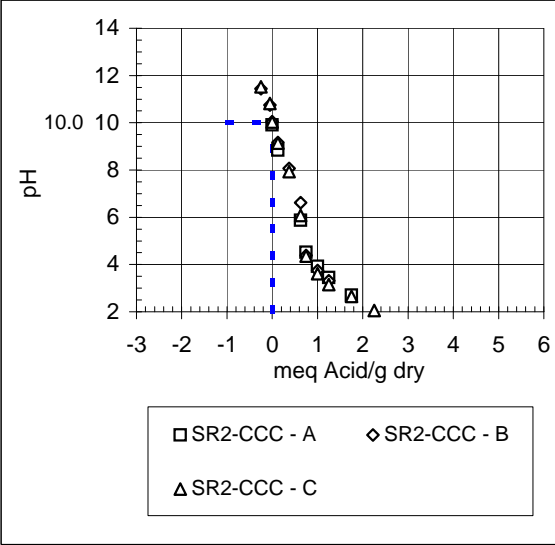
APC: IO+SCR+ESP(CS)

MAD
(SCR Off)

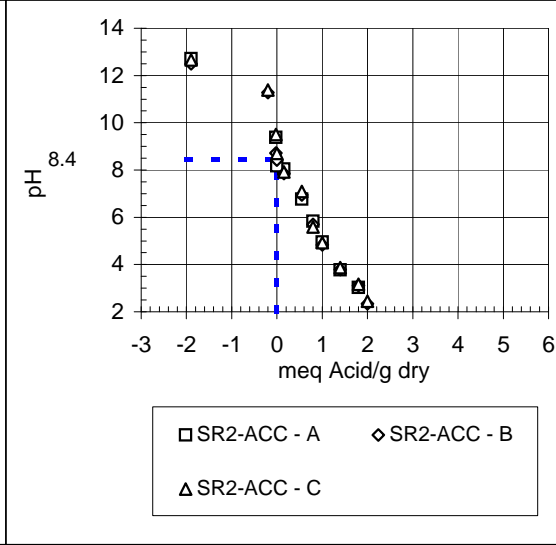
MAS
(SCR On)

Fixated Scrubber Sludge Comparisons

Off

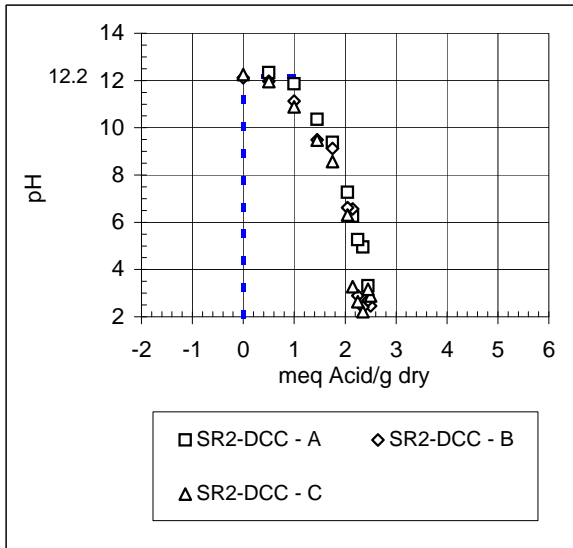


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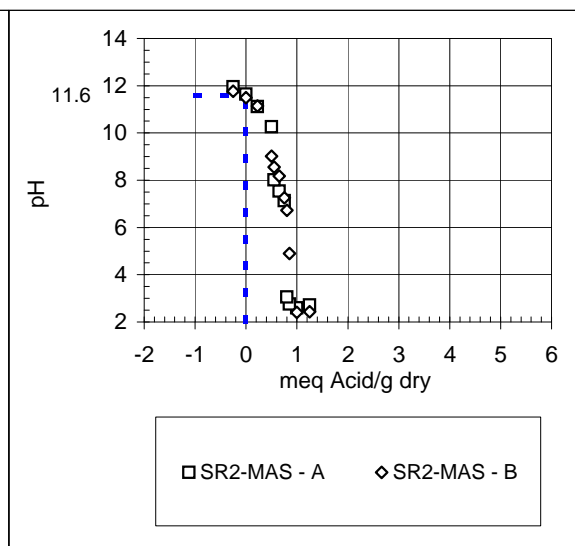
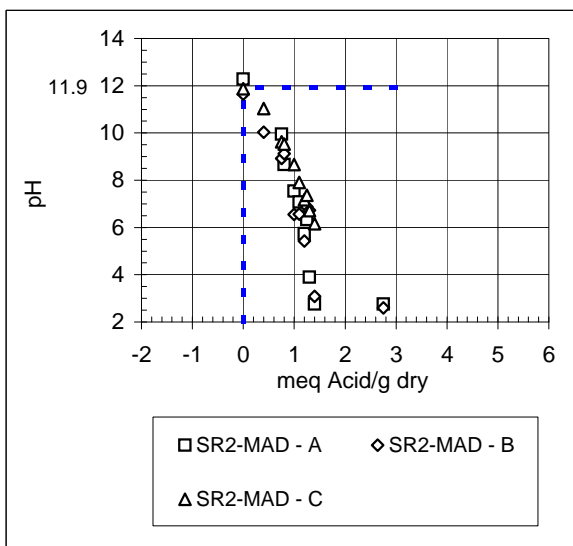
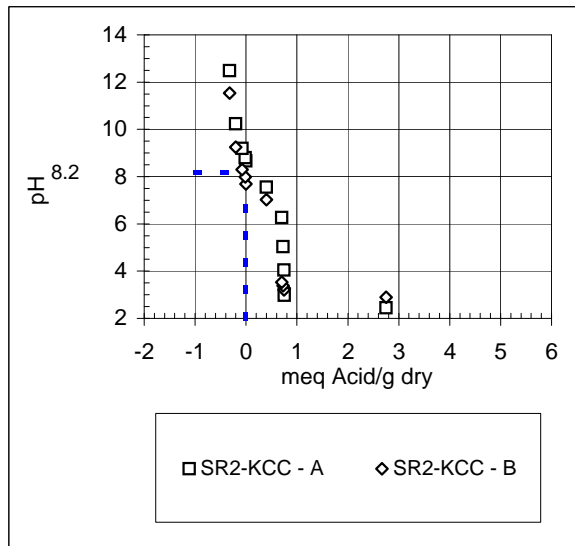
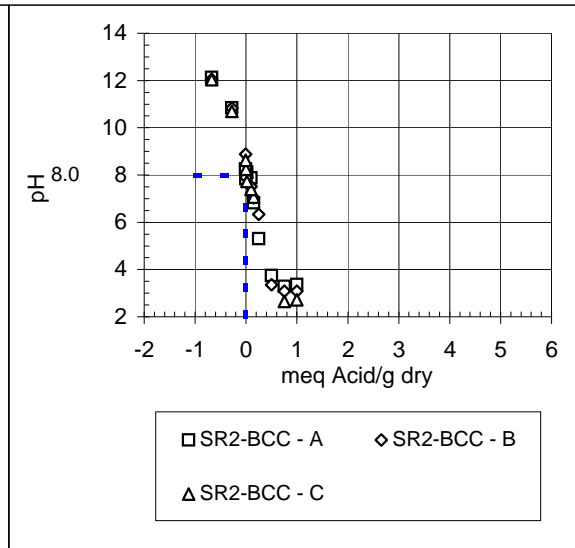


Fixated Scrubber Sludge Comparisons

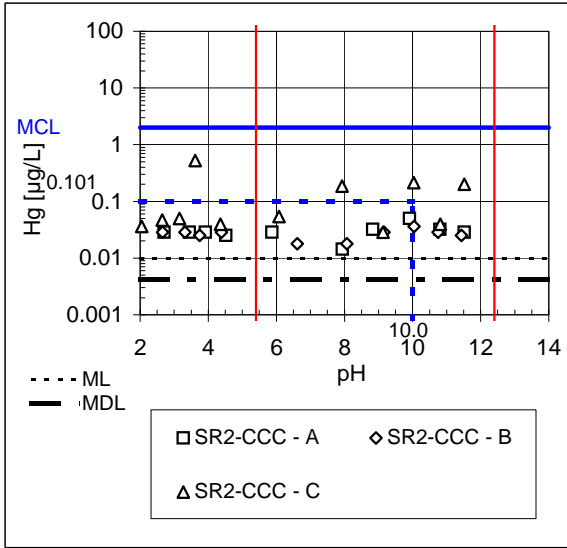
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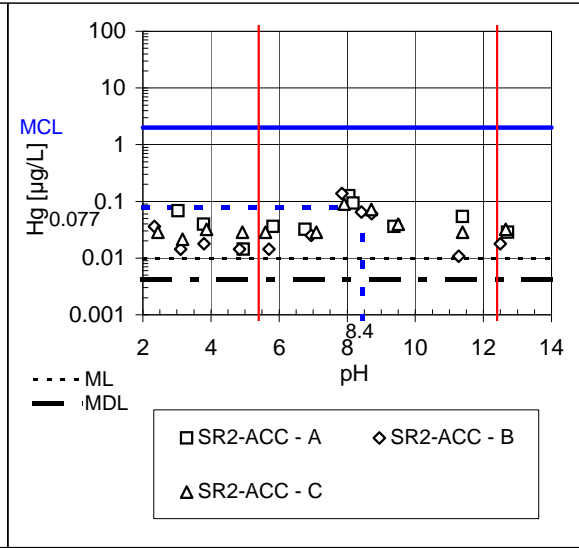
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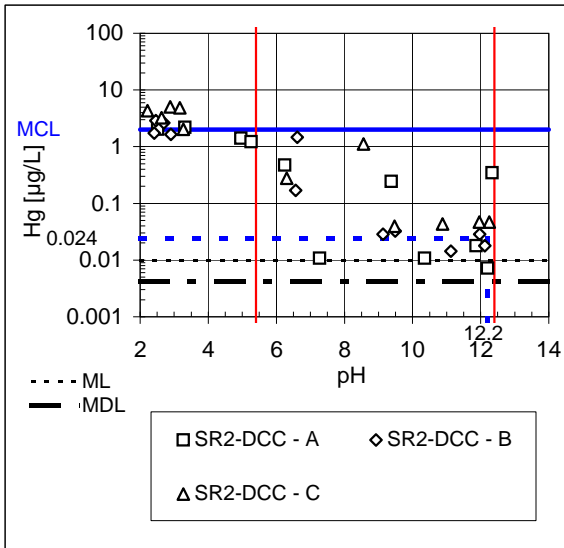
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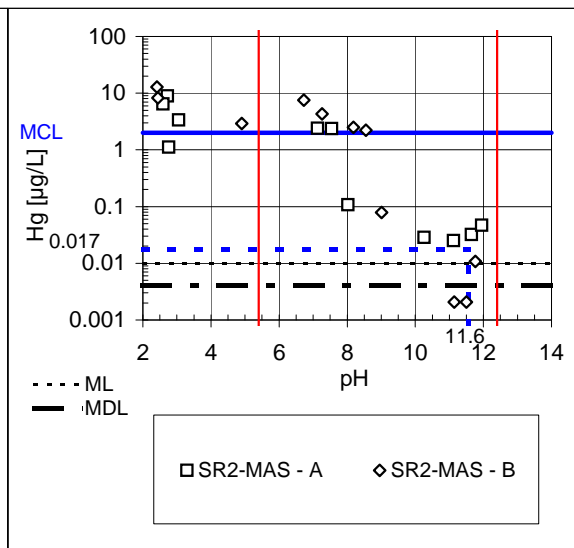
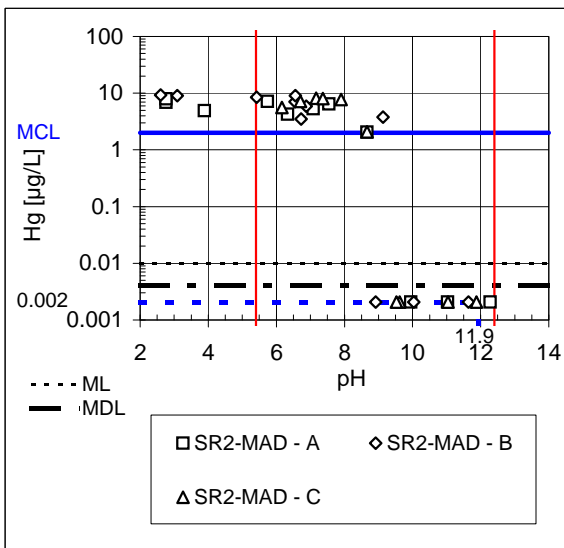
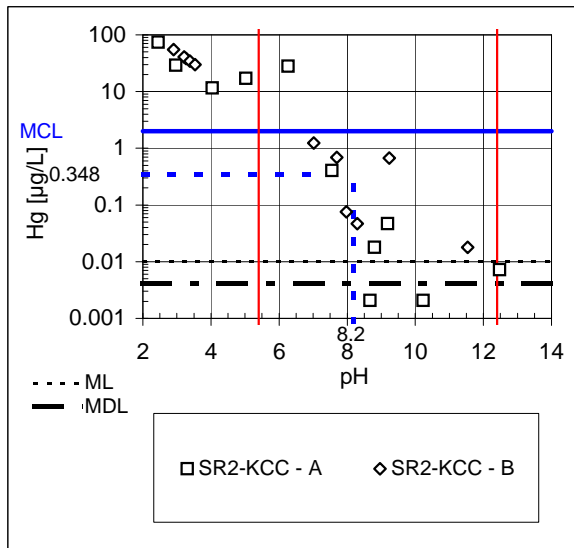
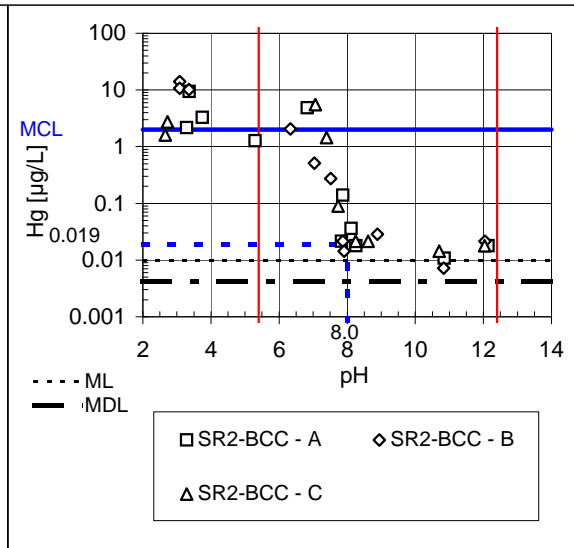
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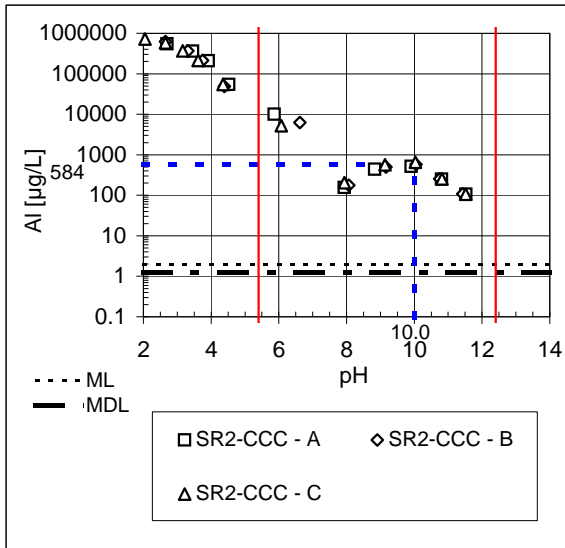
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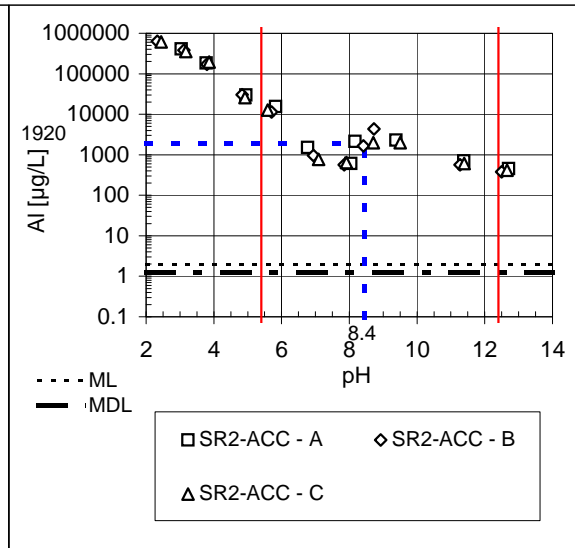
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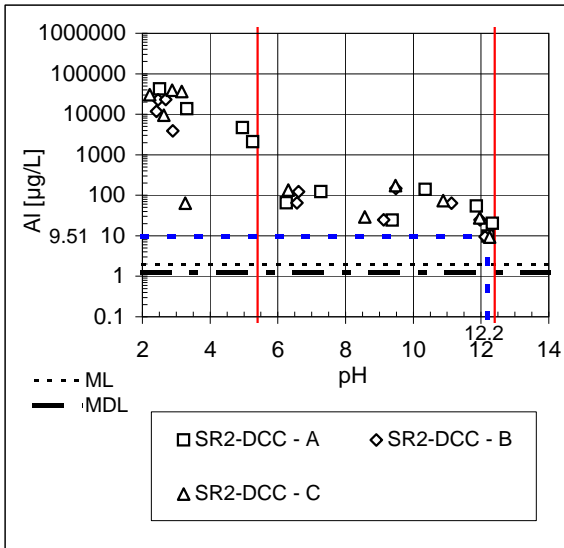
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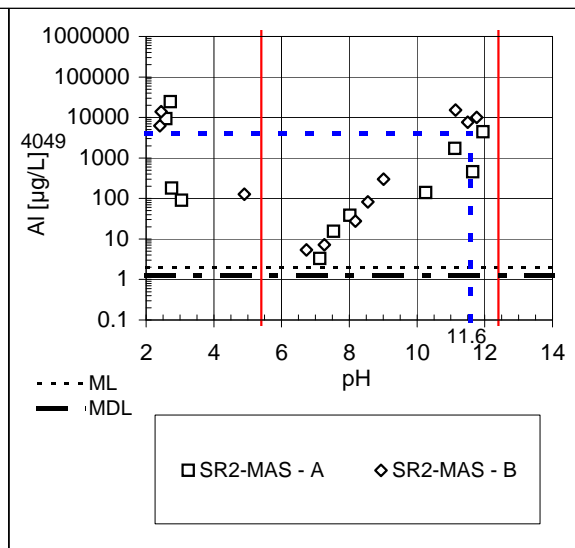
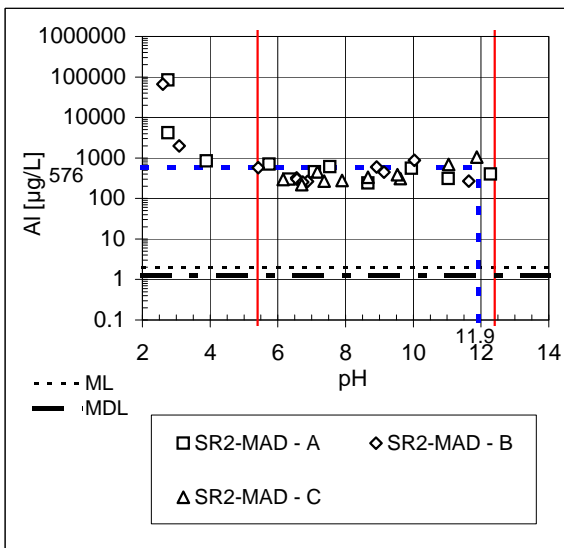
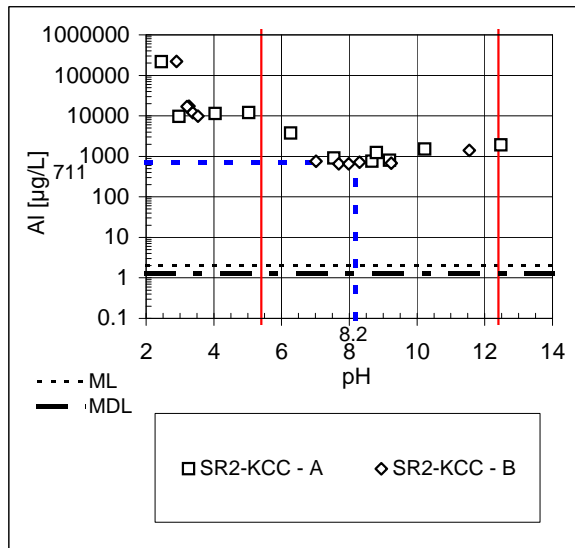
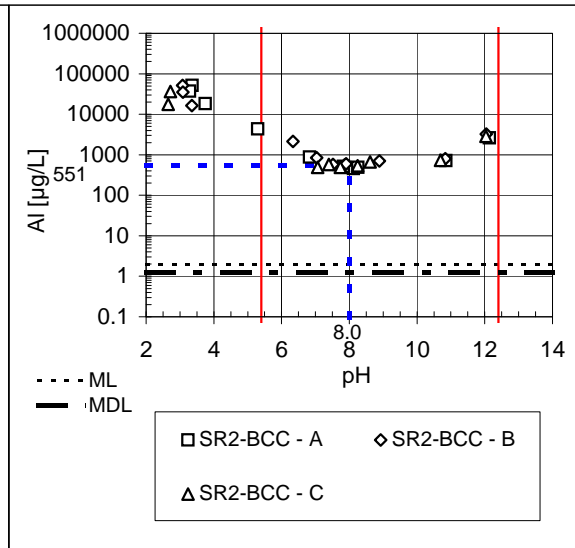
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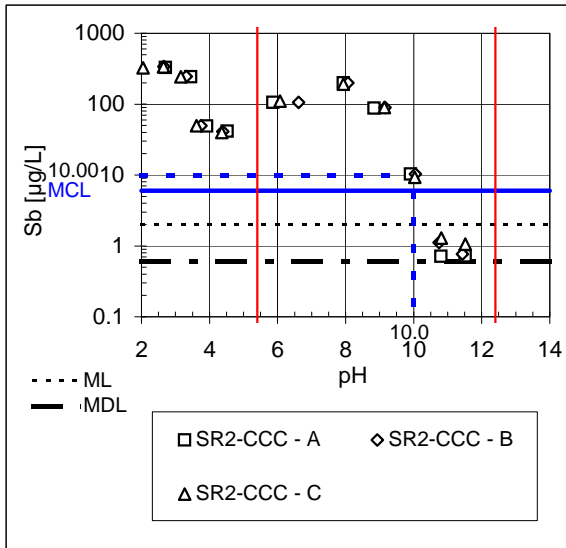
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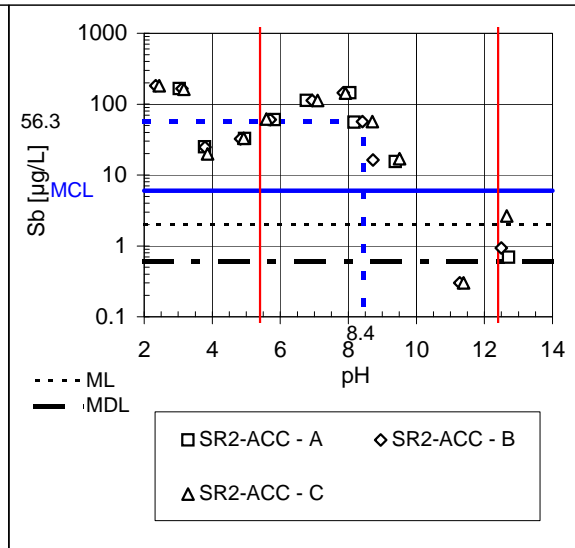
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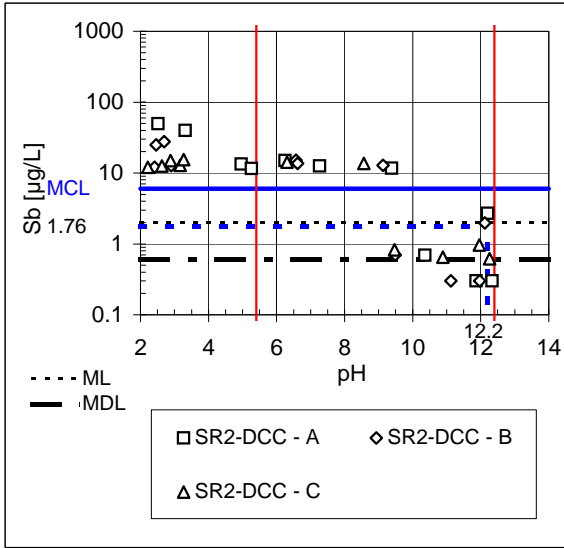
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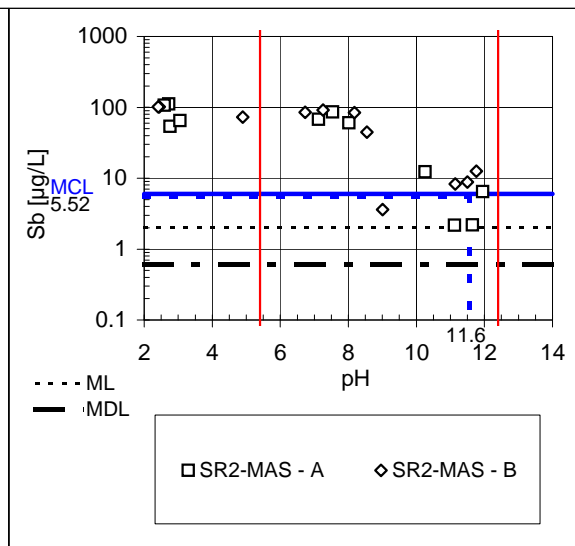
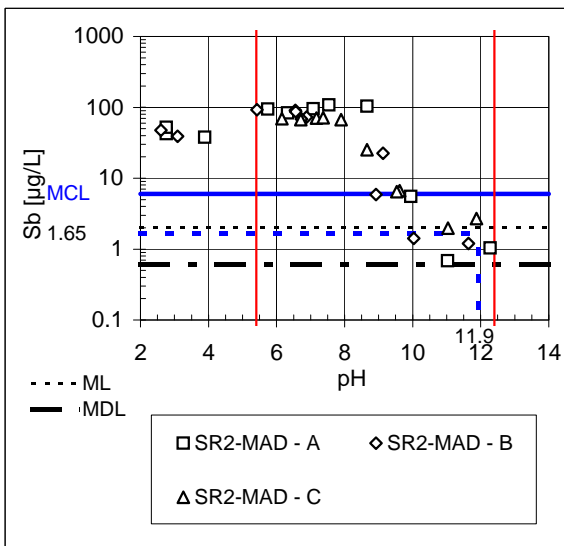
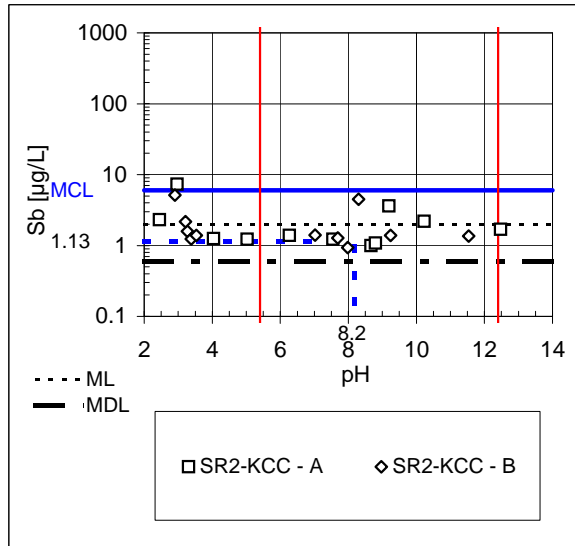
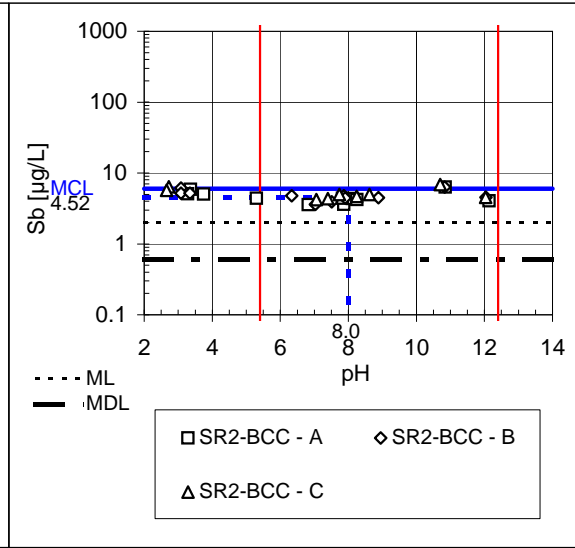
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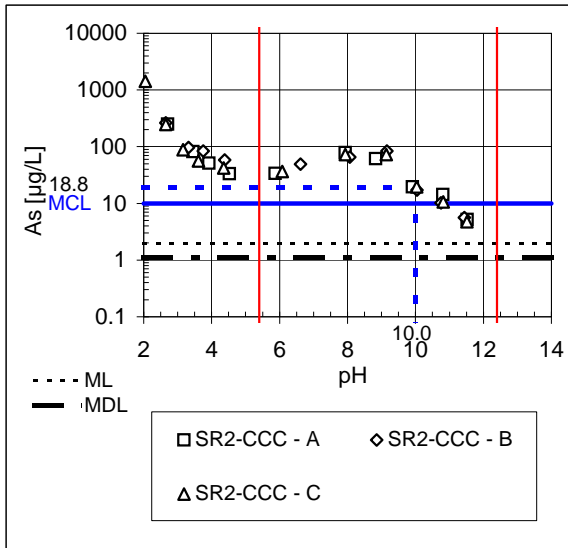
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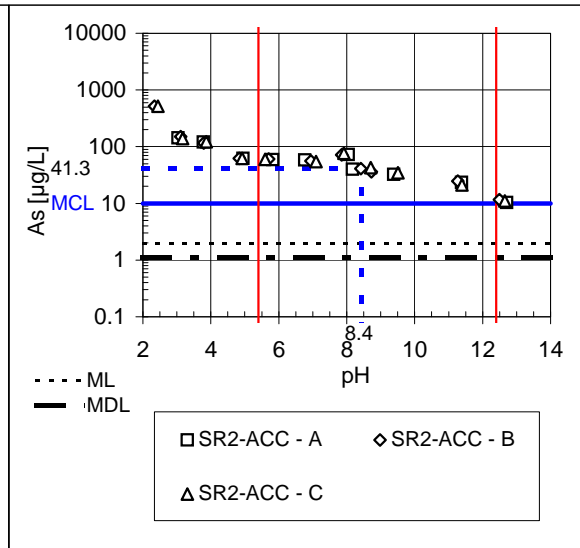
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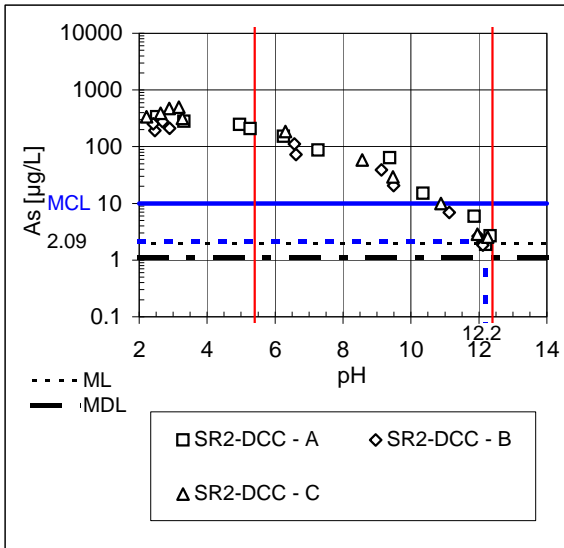
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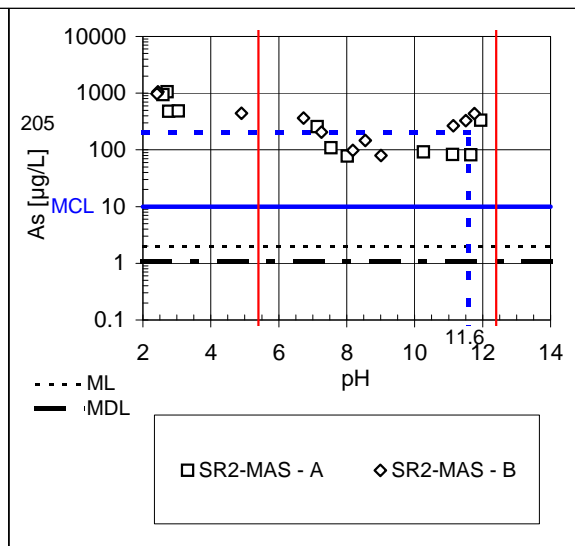
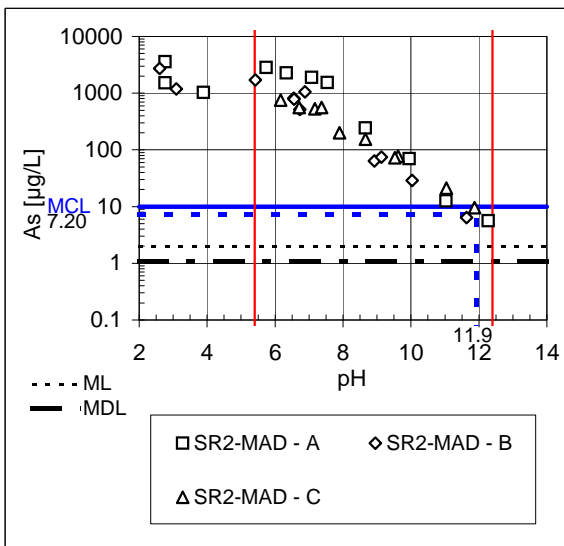
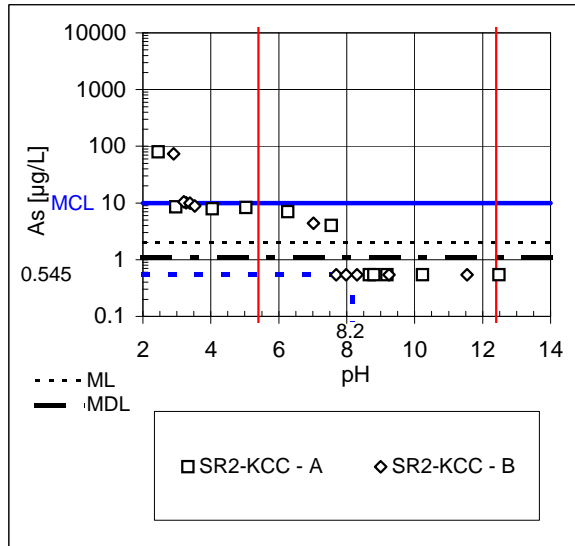
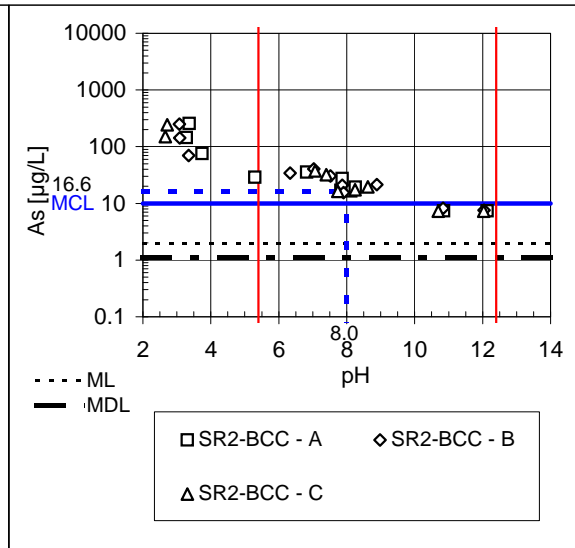
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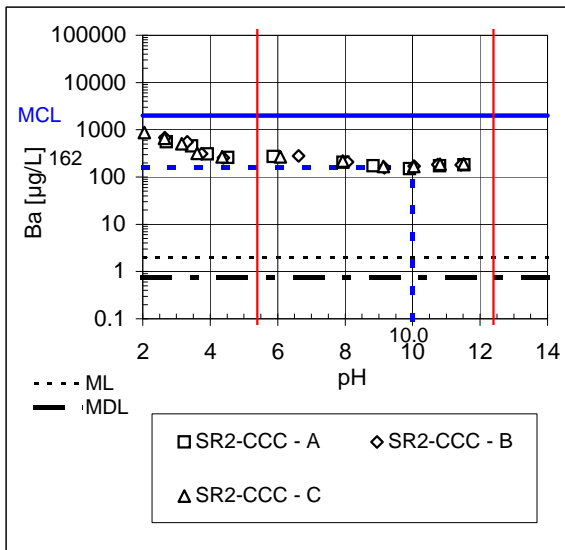
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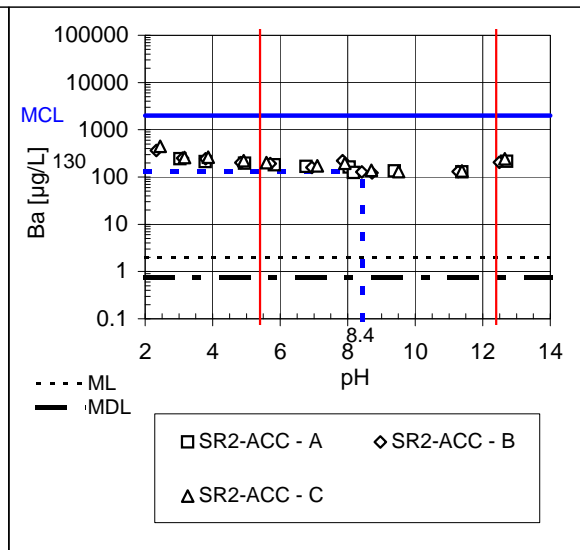
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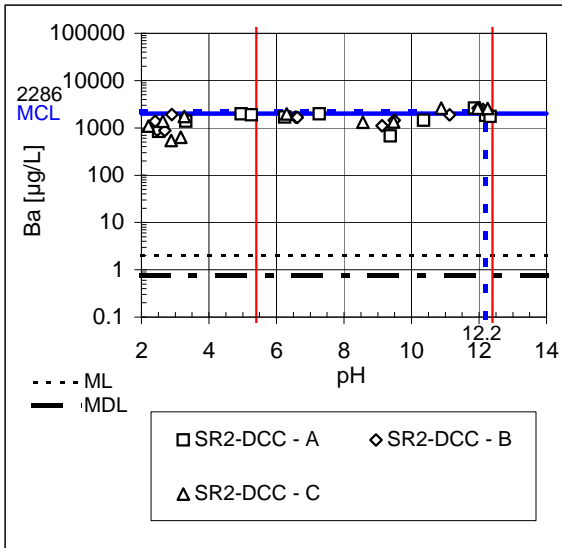
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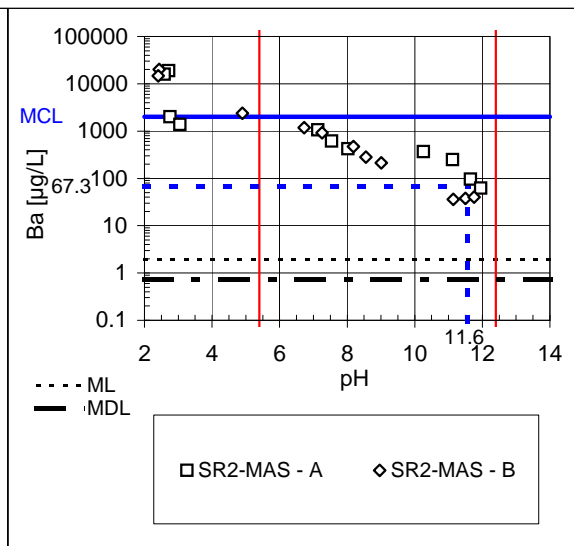
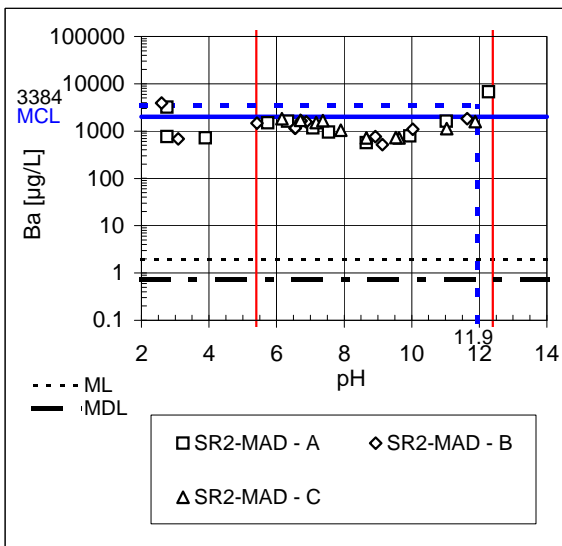
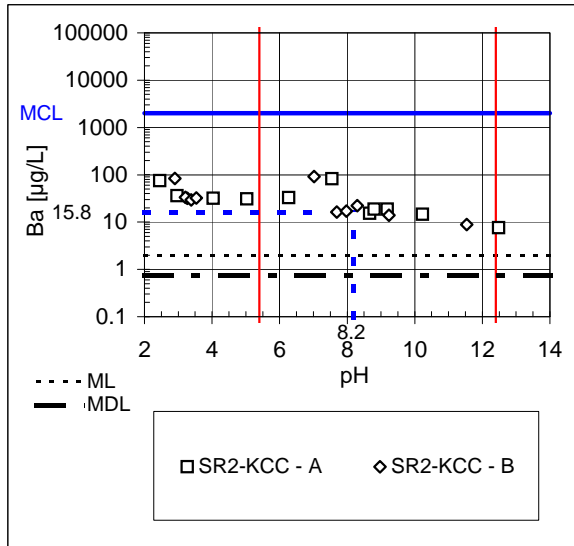
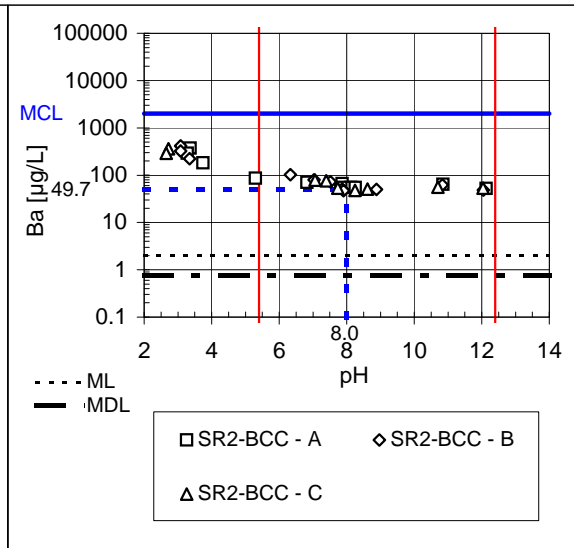
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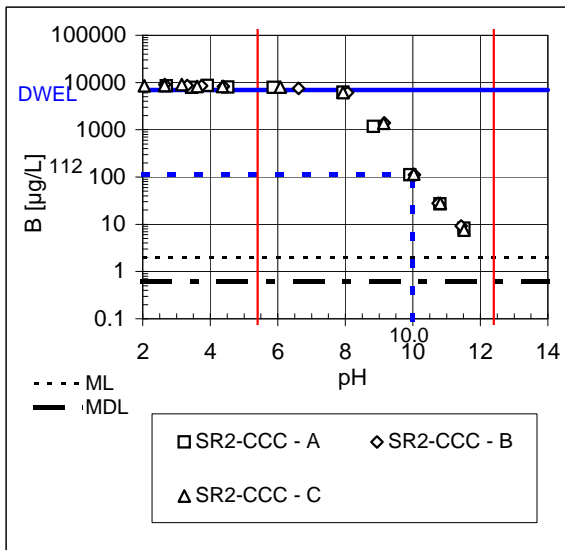
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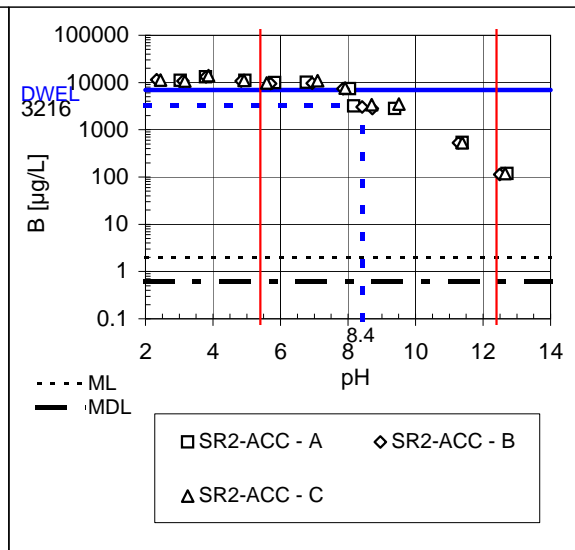
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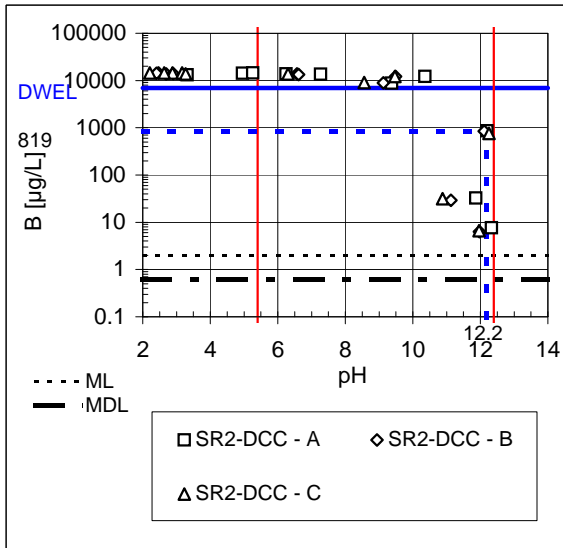
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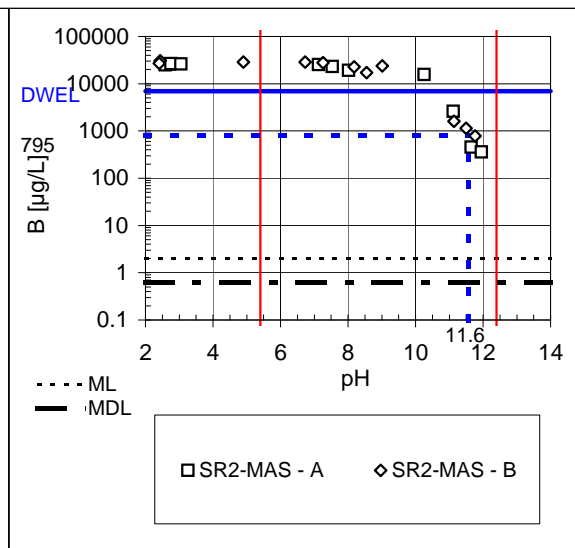
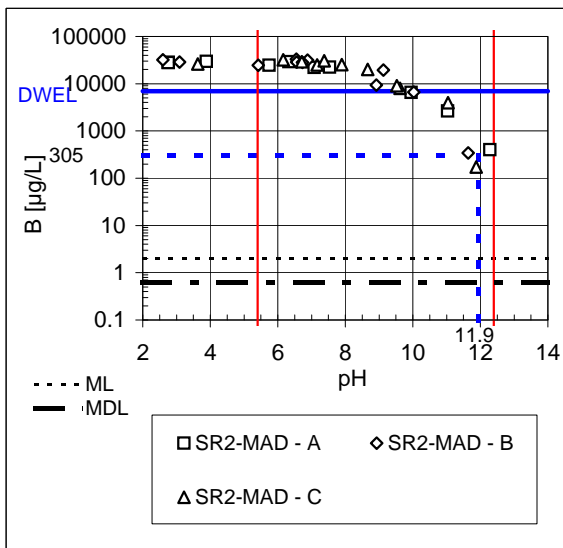
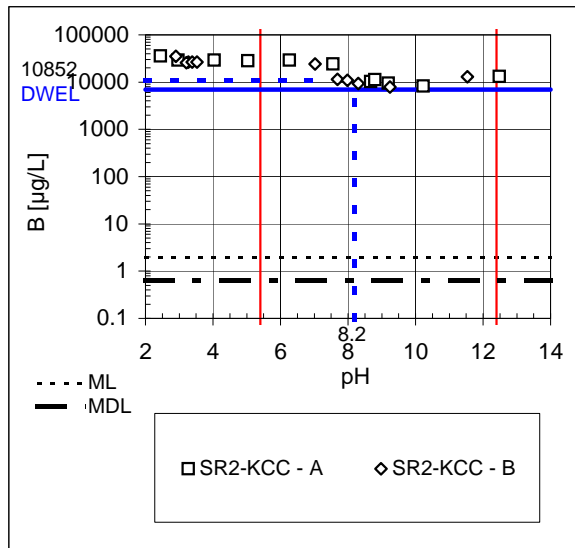
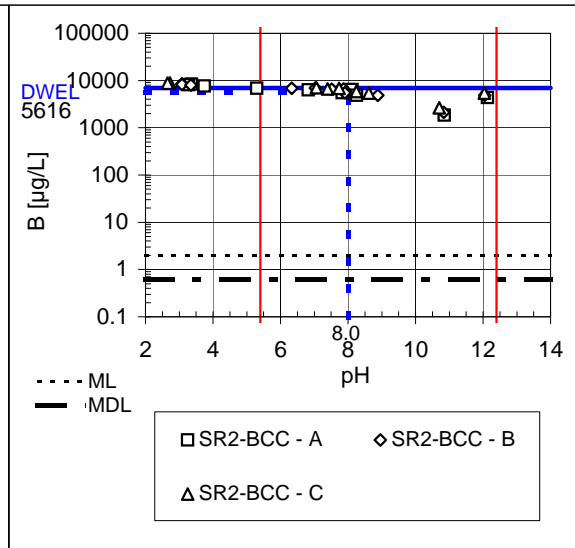
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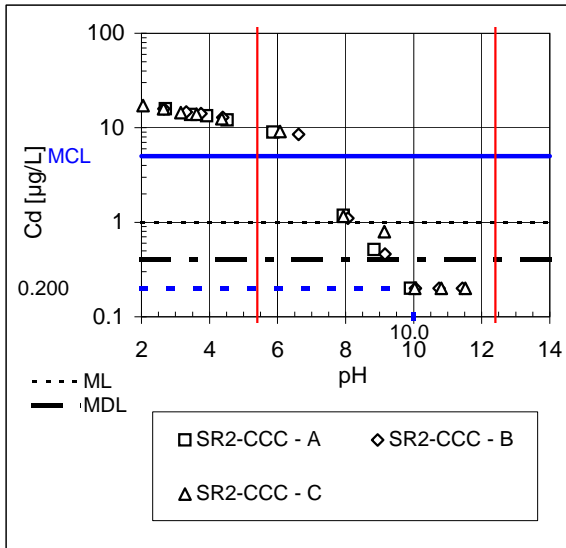
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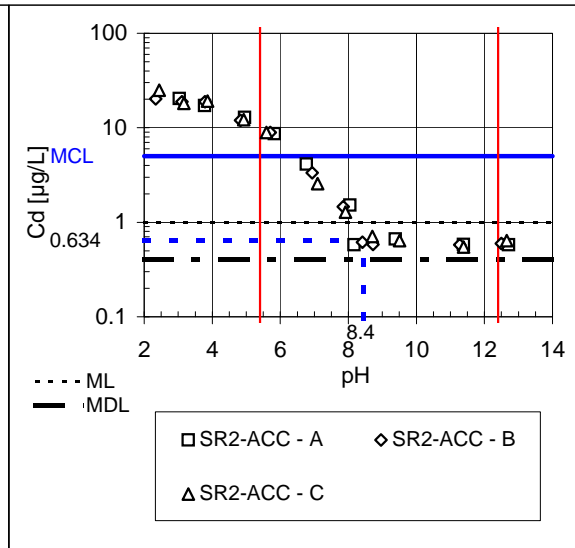
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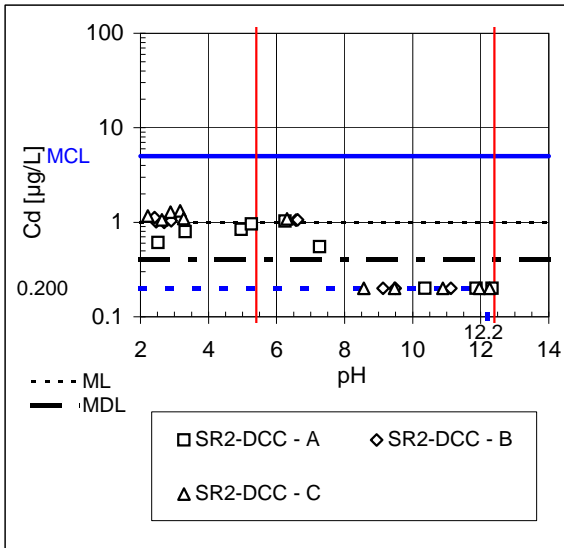
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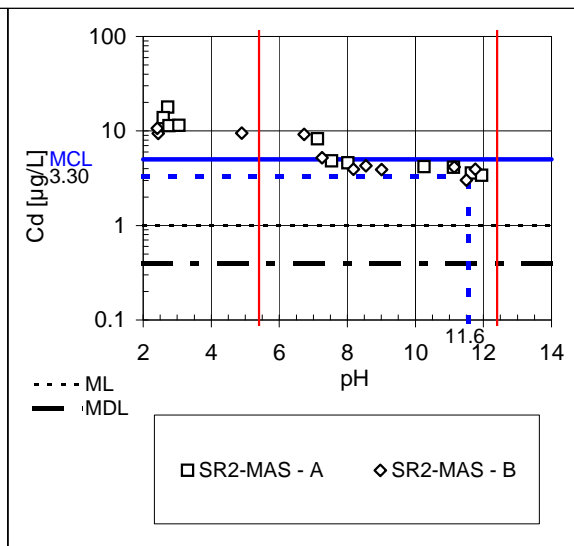
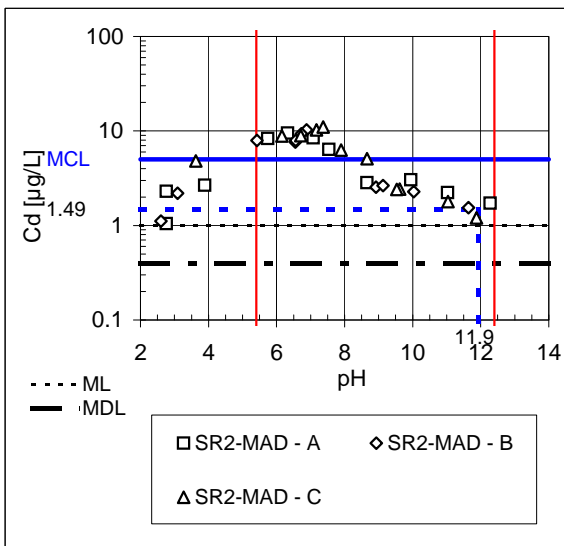
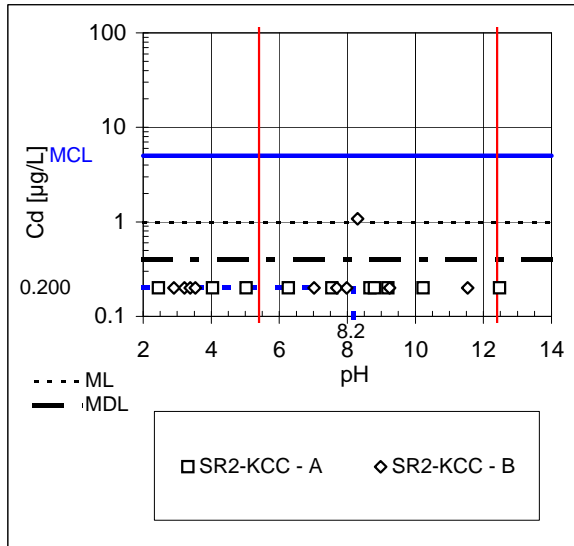
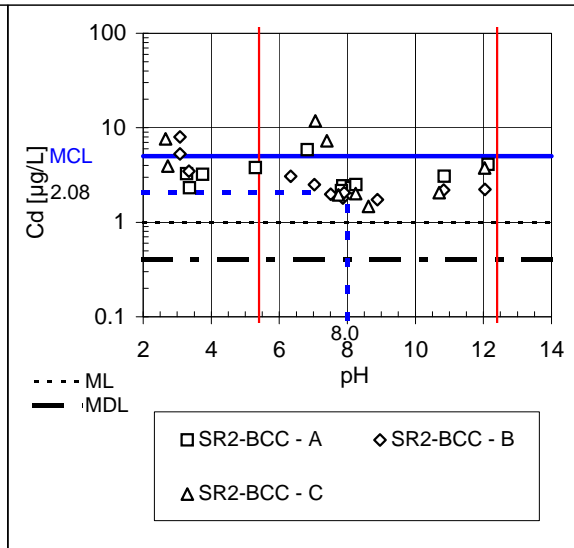
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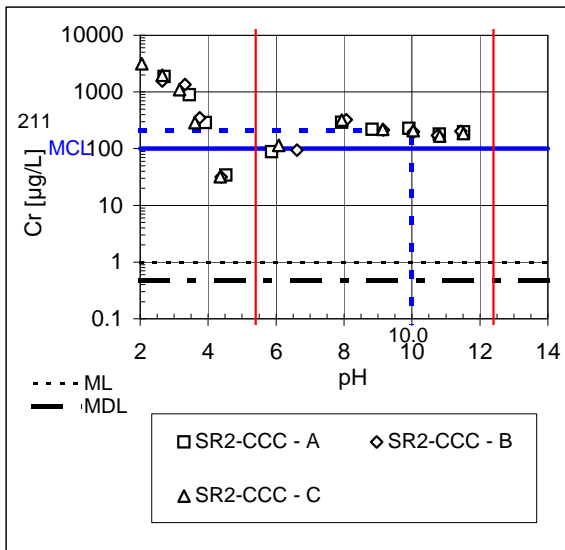
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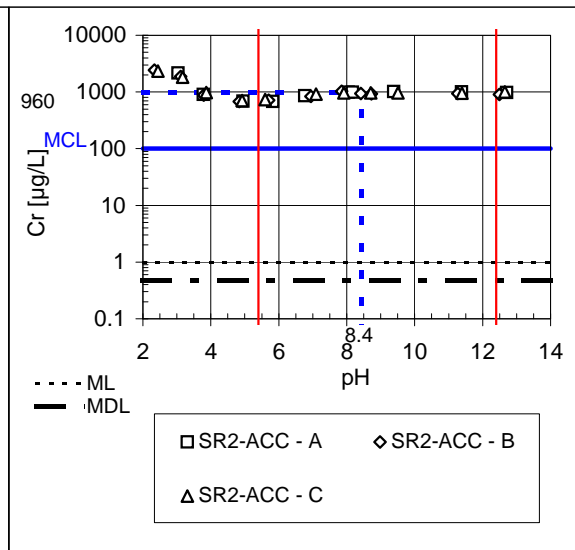
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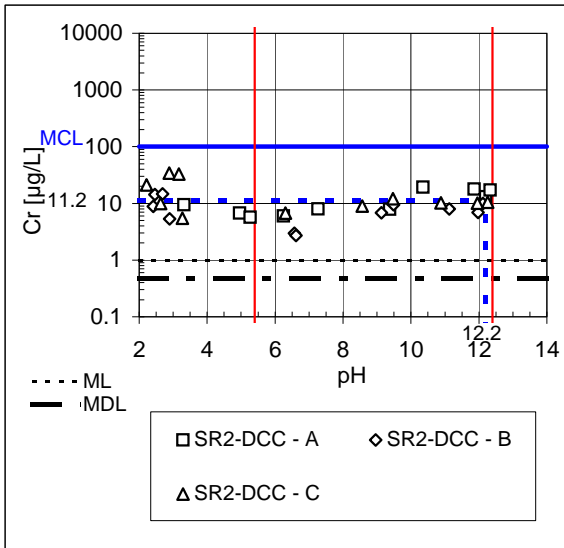
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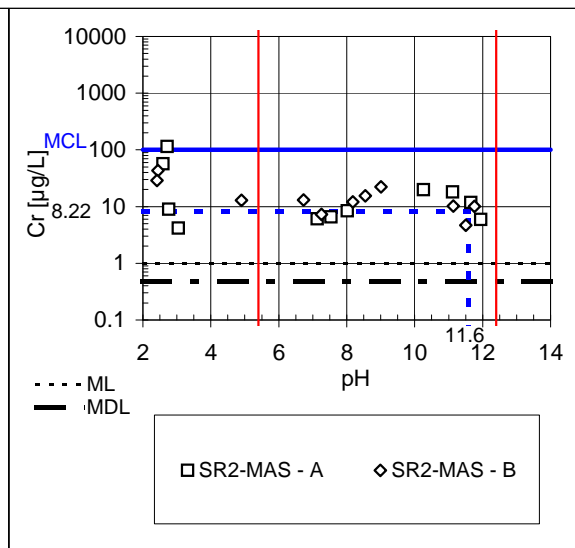
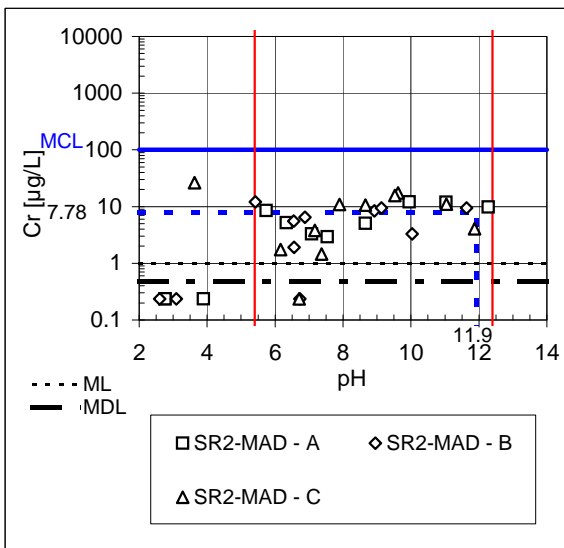
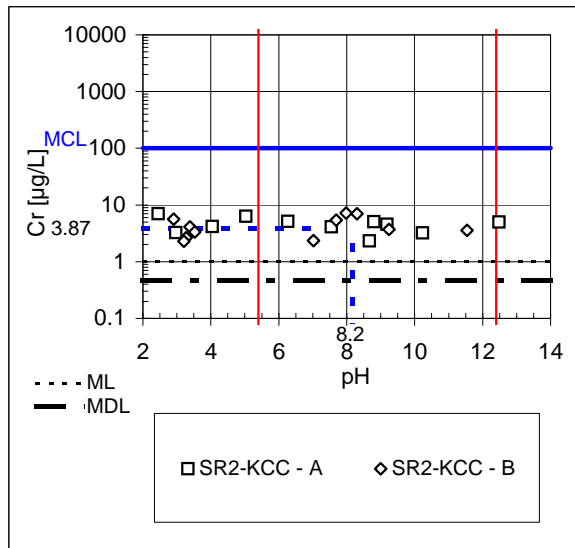
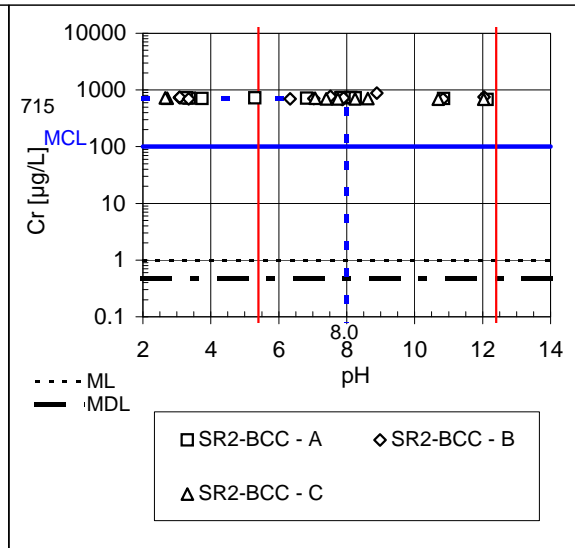
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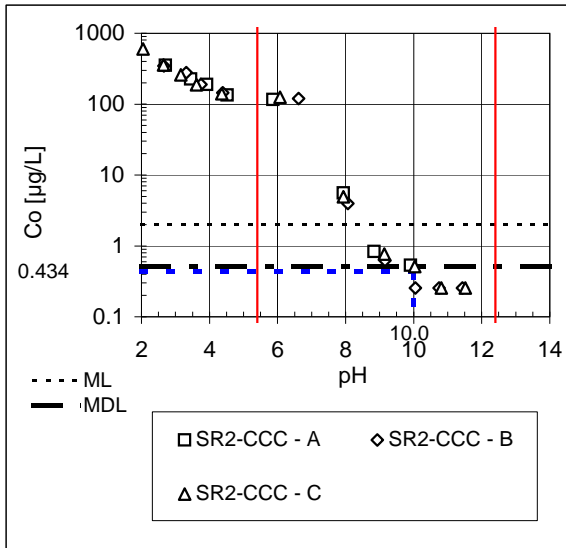
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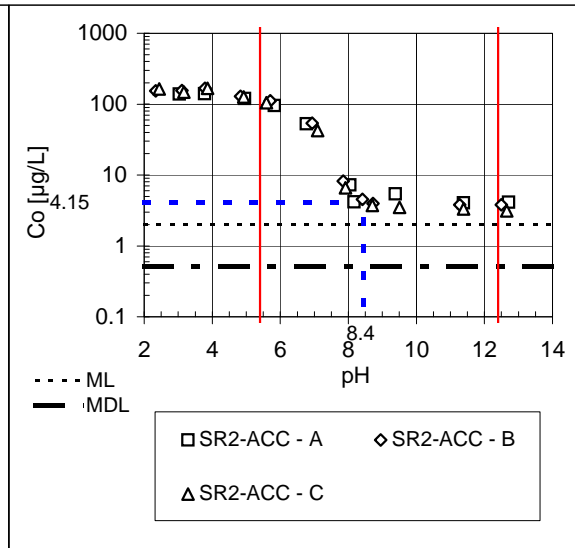
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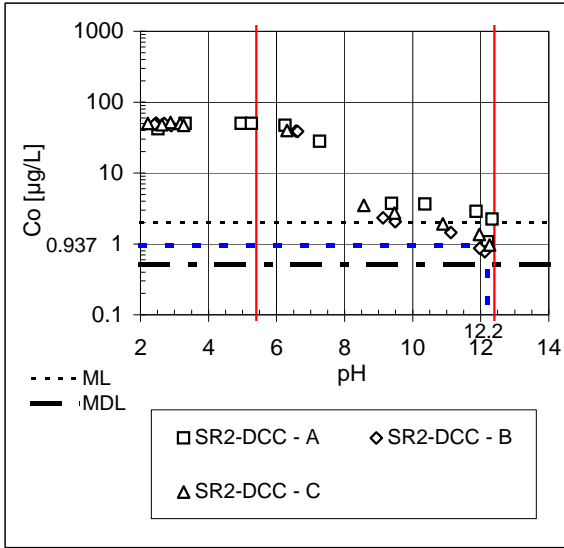
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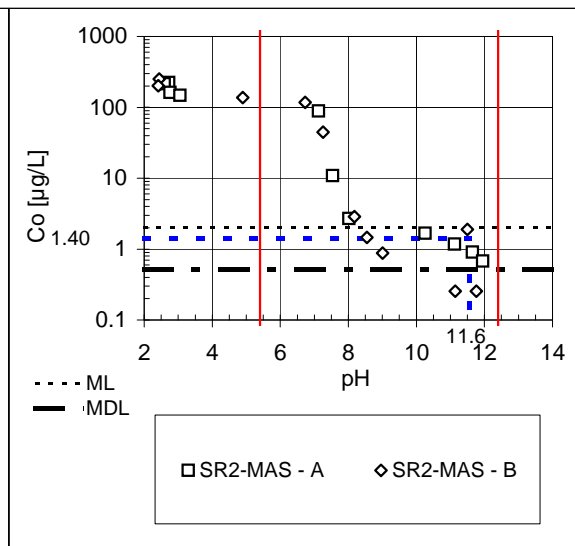
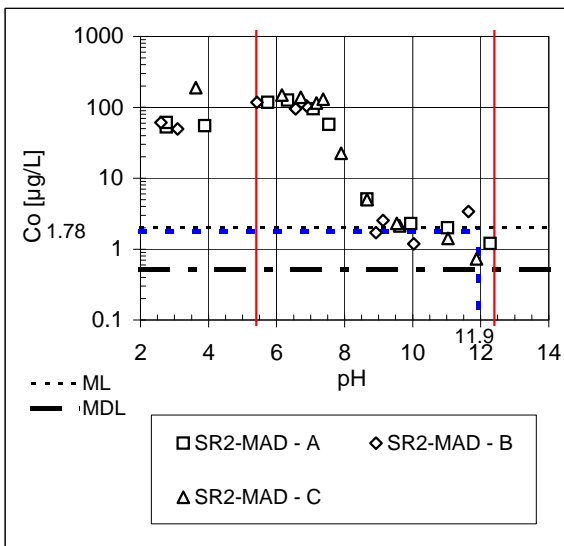
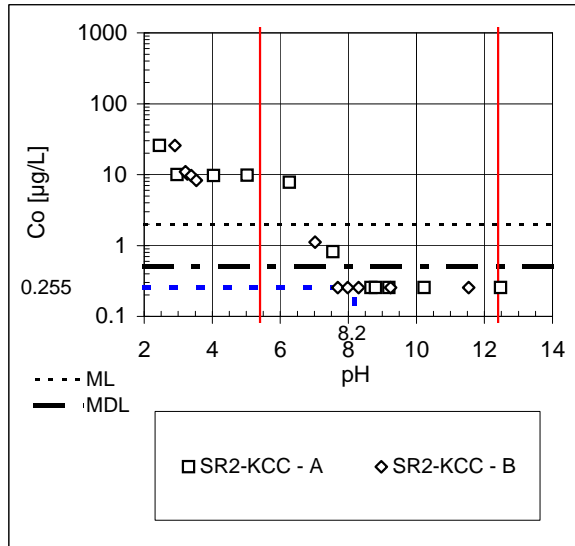
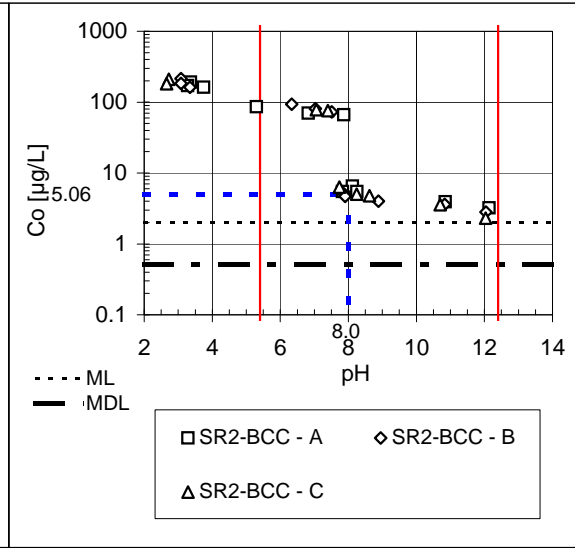
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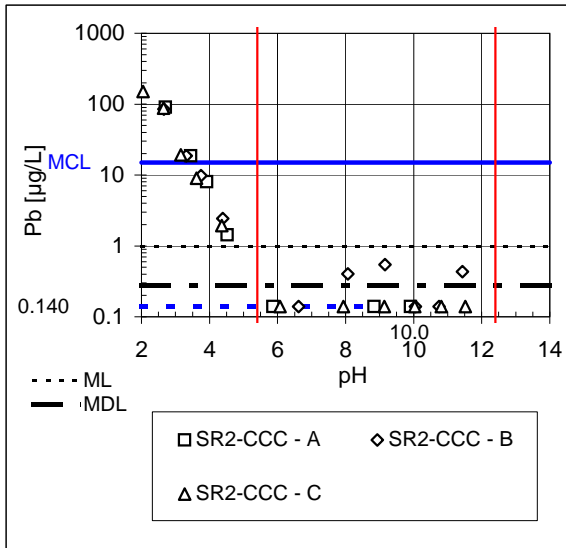
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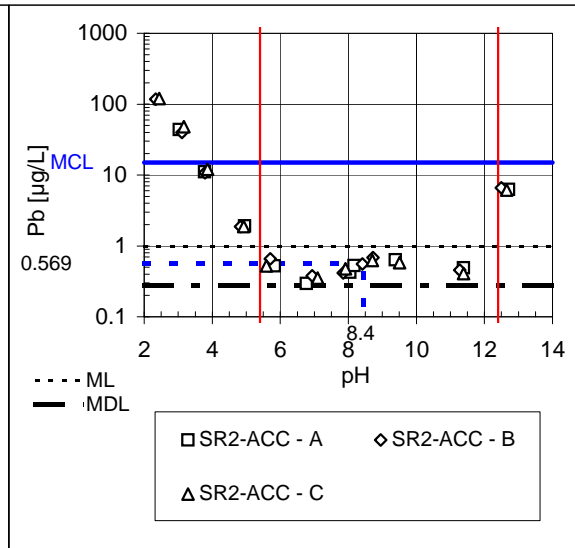
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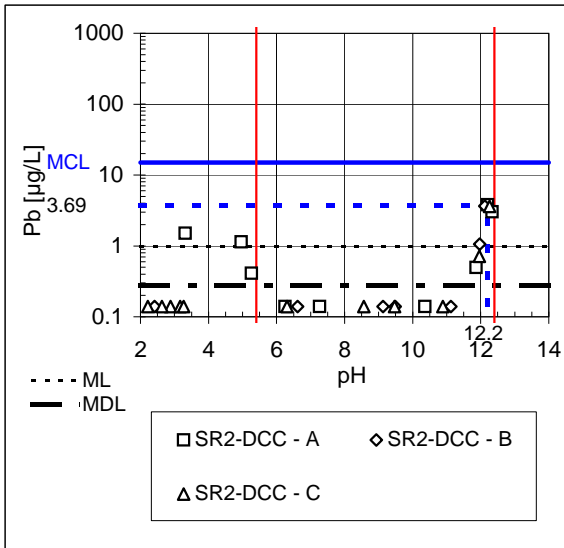
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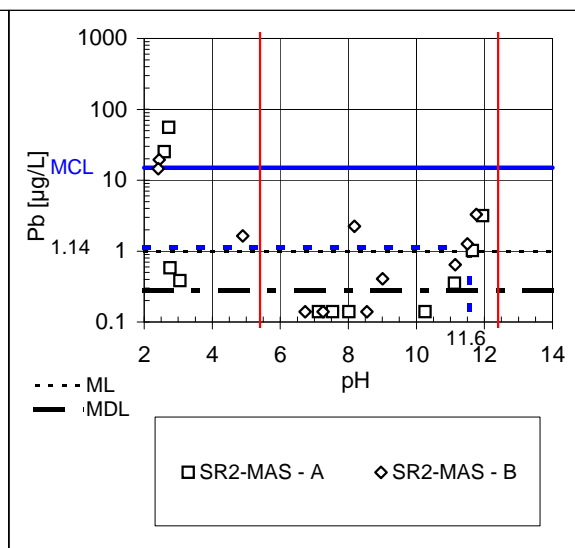
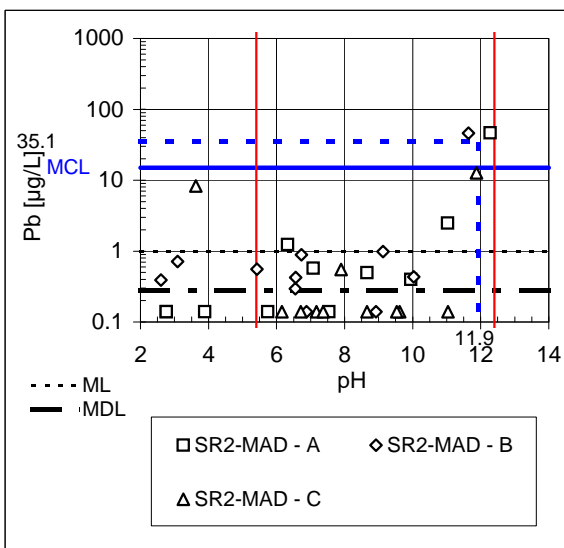
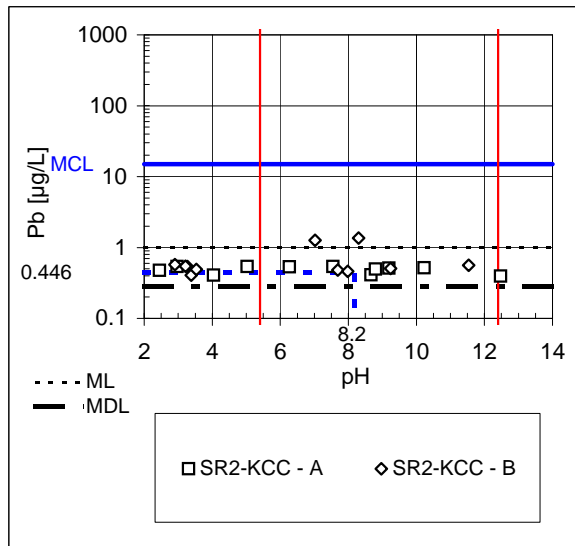
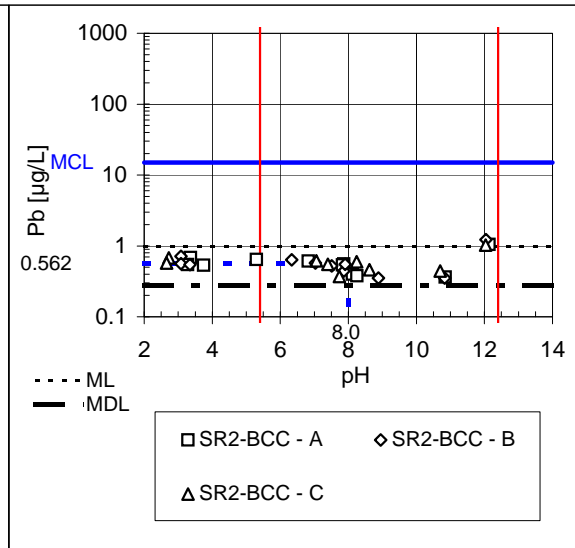
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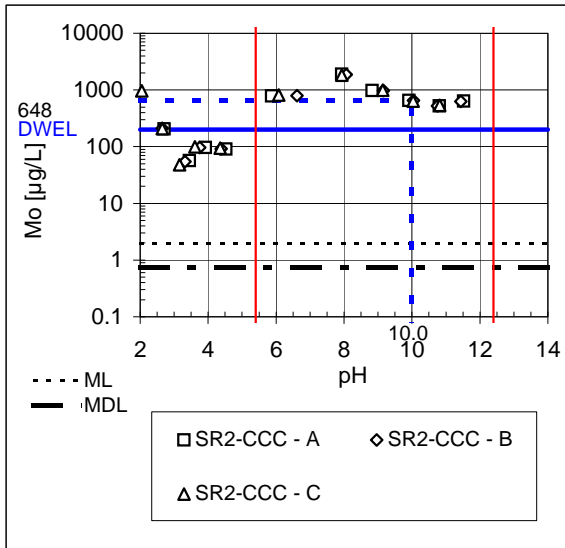
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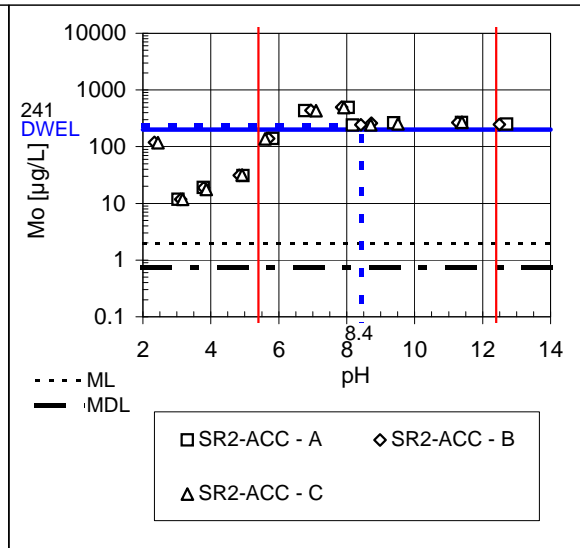
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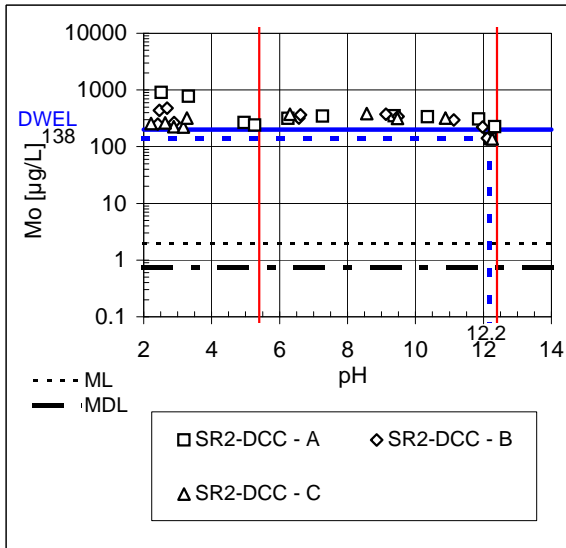
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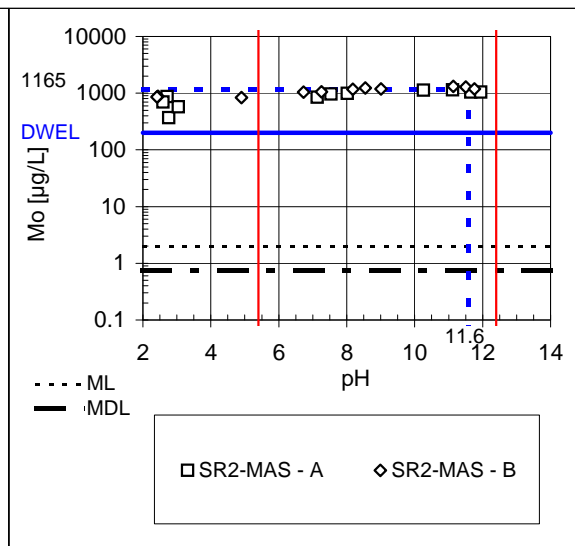
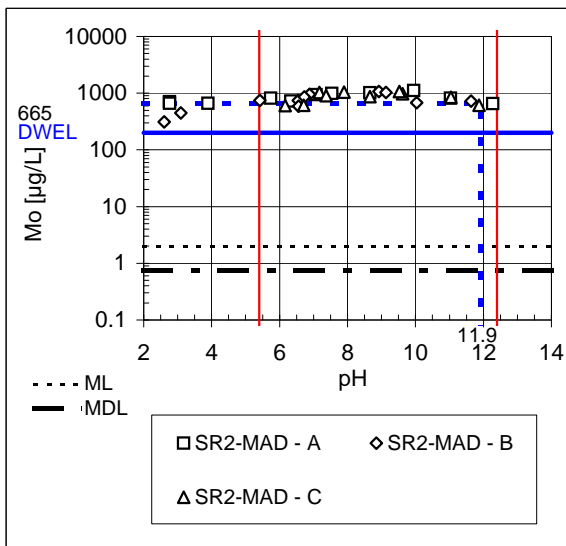
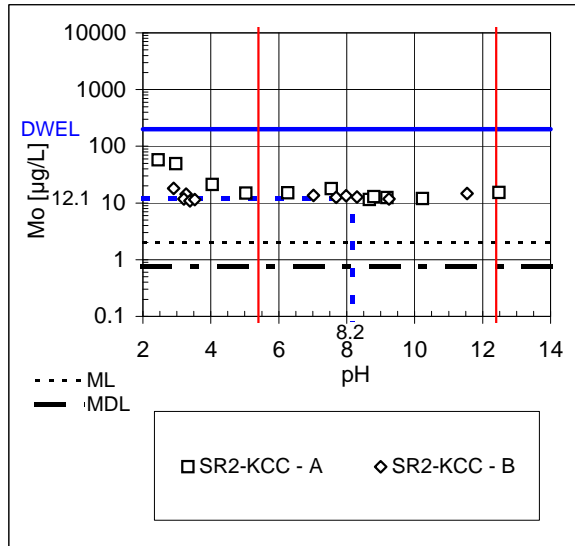
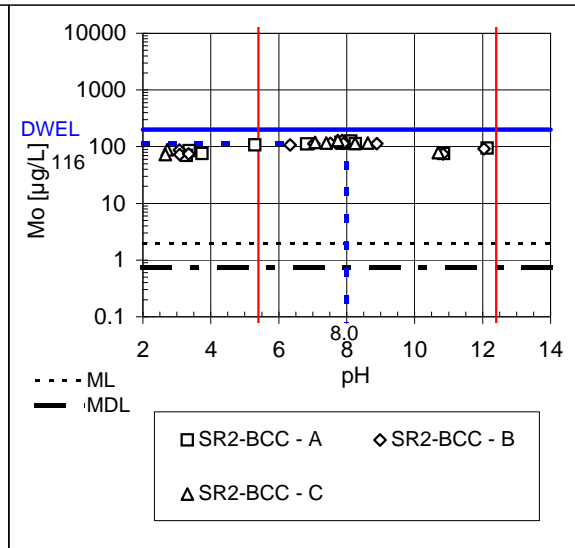
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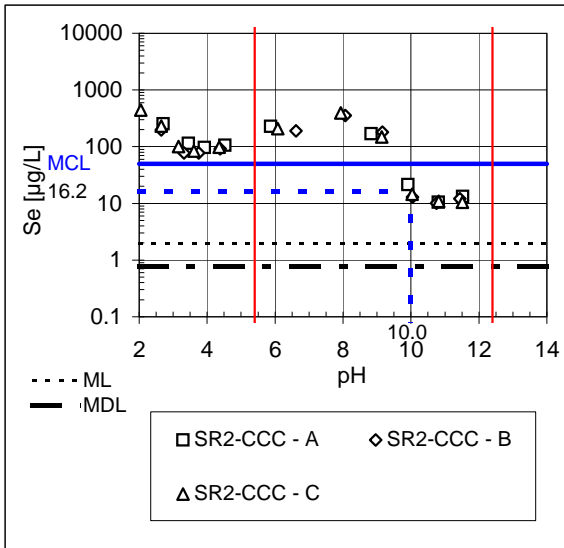
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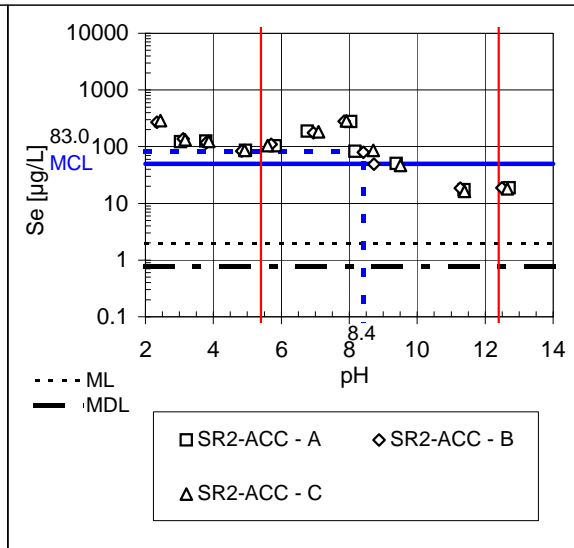
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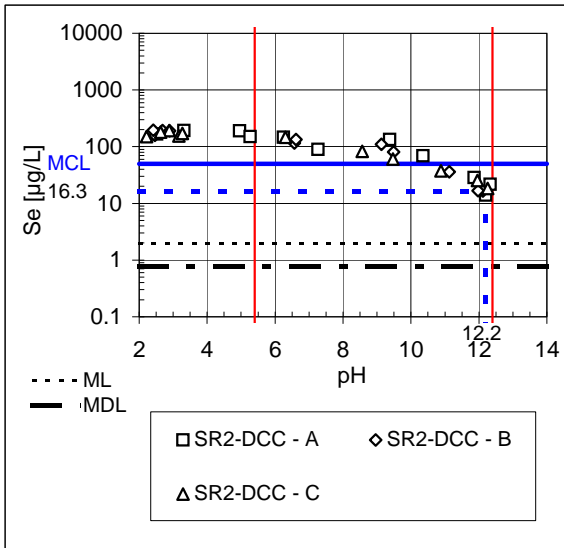
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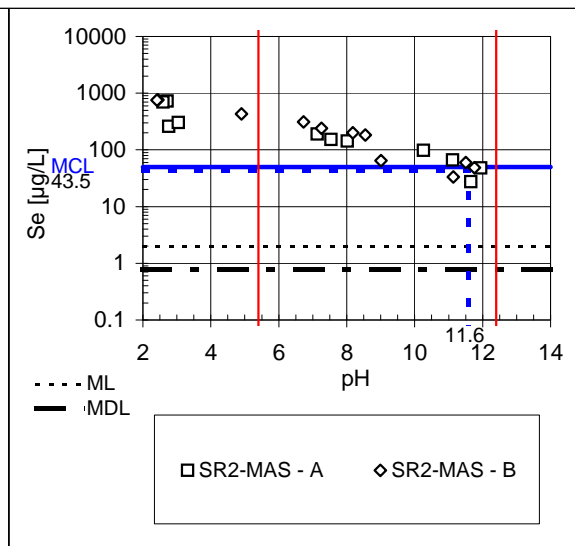
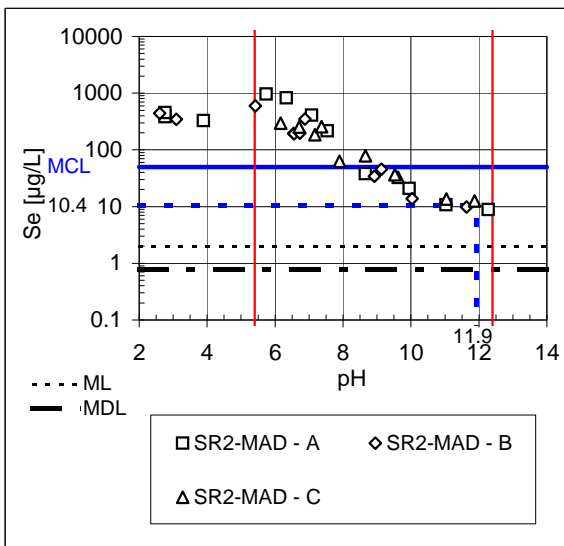
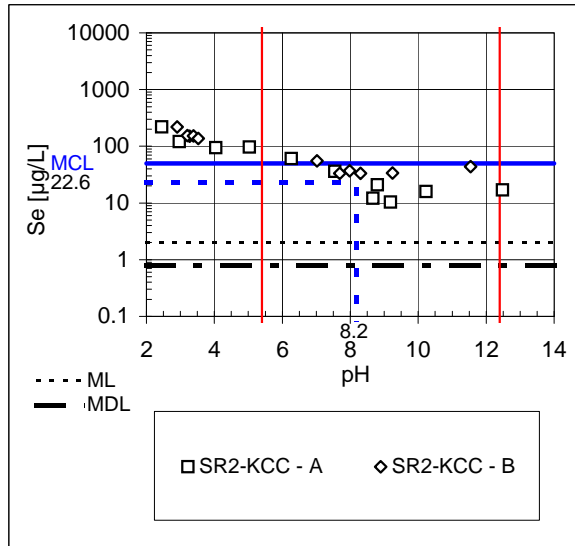
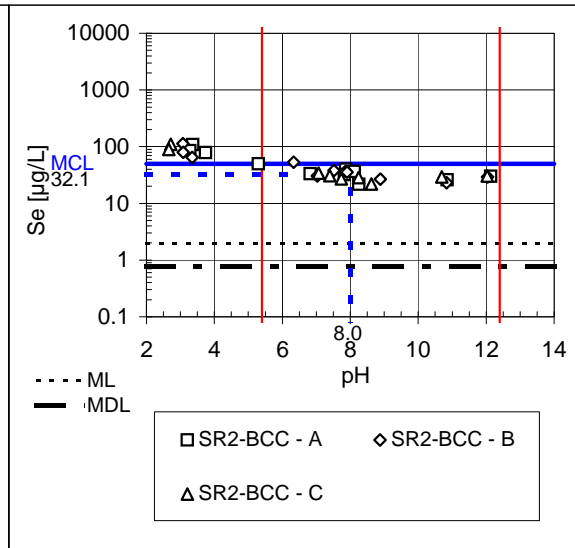
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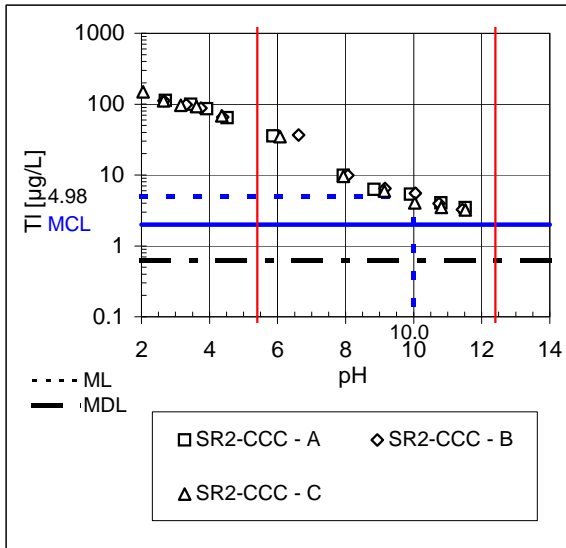
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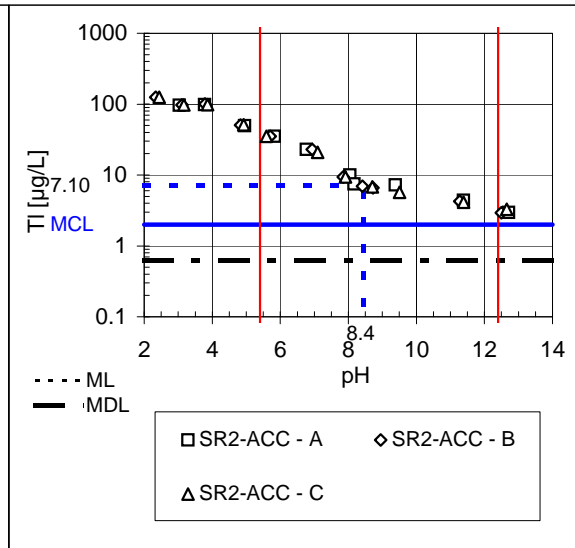
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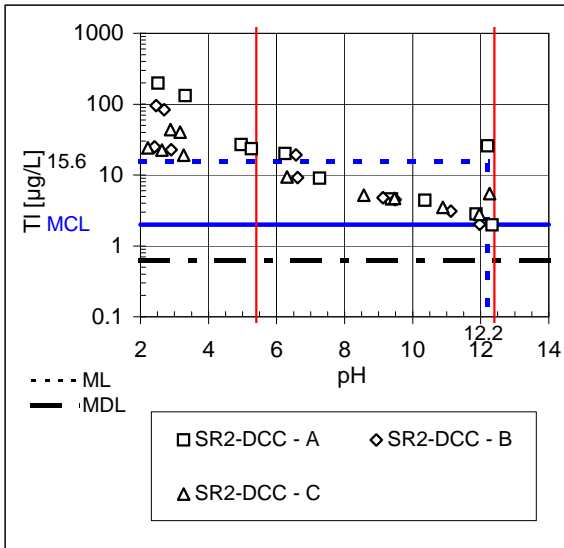
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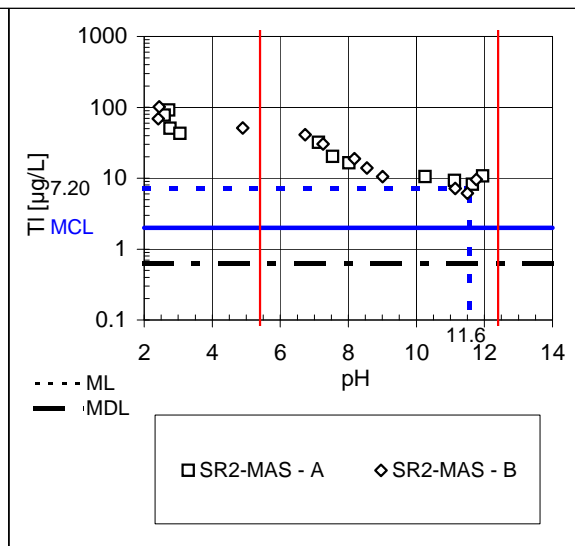
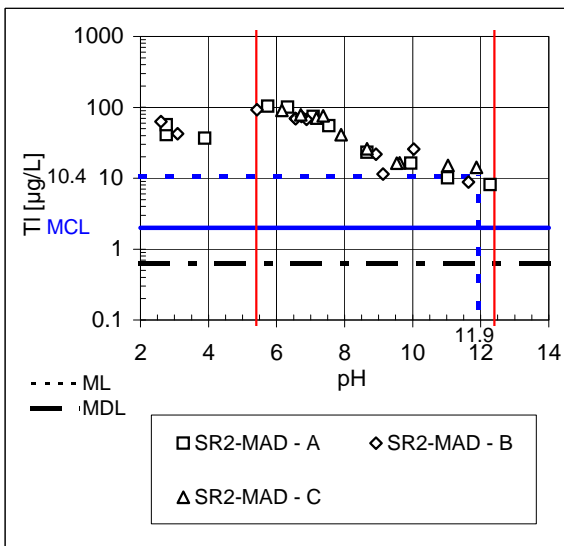
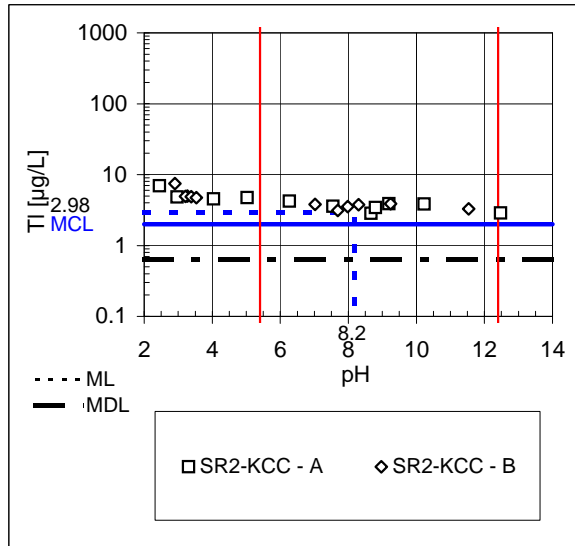
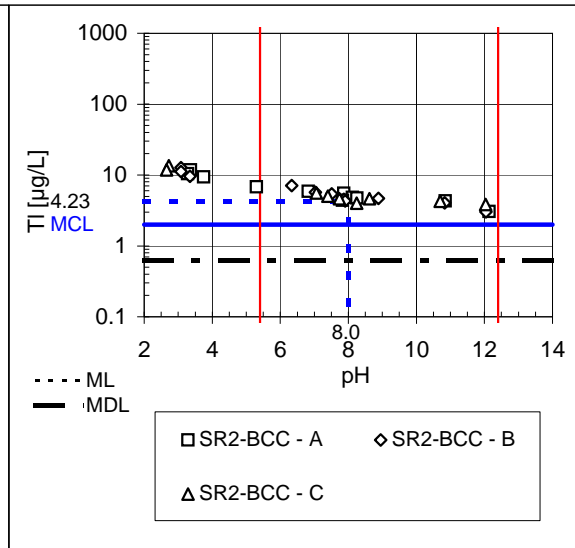
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SR002.1 Outliers resulting from inconsistency in pH determination.

Material	Test Position	Replicate	Conc. [$\mu\text{g/L}$]													
			pH	Hg	Al	Sb	As	Ba	B	Cd	Cr	Co	Pb	Mo	Se	Tl
			S.I.	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$	$\mu\text{g/L}$
AFA	T08	A	8.40	0.245	7570	31.4	57.9	312	557	0.608	1310	8.4	0	877	83	3.33
BFA	T08	C	8.36	0.01	1210	6.17	29.3	142	7532	1.190	873	7.0	0	1874	14	1.94
KFA	T05	B	5.05	0.02	721	34.9	114	226	37652	1.478	6	1.8	0	2071	40.9	87.9
AGD	T01	C	1.35	0.01	52800	61.3	243	80.0	7185	2.0	900	106	64	117	119	8.65
AGD	T02	C	1.65	0.01	43800	20.6	129	93.7	7859	2.0	882	90.3	35	61.9	68	7.96
AGD	T03	C	1.85	0.03	39700	16.1	13.3	83.8	8154	1.93	869	85.0	8	7.9	37	6.56
AGD	T04	C	2.03	0.03	34800	9.55	9.26	70.4	7103	1.77	848	79.0	3	0.4	20	7.38
AGD	T05	C	2.32	0.01	24700	5.01	7.16	69.7	7266	1.750	732	81.9	0	0.4	25	7.45
AGD	T06	C	2.58	0.01	22000	4.15	6.11	61.8	7647	1.700	787	77.0	0	4.1	21	6.50
AGD	T07	C	3.76	0.02	9580	3.65	6.12	37.2	6632	1.660	719	63.2	0	21.6	20	7.15
BGD	T09	B	7.61	0.025	2440	2.79	5.54	162	583	0.200	220	0.26	0	61.4	3	4.15
NAU	T06	B	4.12	0.002	341	0.971	0.55	65.9	2164	0.200	6	1.4	0	14.5	17.0	4.36
BCC	T03	C	2.71	1.49	3780	6.02	69.1	188	8435	7.360	703	168.0	1	77	61	9.91
BCC	T04	C	3.74	1.74	808	4.73	28.4	83.8	7121	9.410	712	83.8	1	103	47	7.07
MAD	T11	C	3.63	8.23	74546	75.6	4317	2725	26299	4.81	26	190	8	697	873	182

SR002.1 Outliers resulting from inconsistency in concentration measurements.

Material	Replicate	Element	pH [S.I.]	Conc. [$\mu\text{g/L}$]
CFA	A	Cd	3.32	72.9
CFA	A	Co	9.00	6.73
CFA	A	Co	7.92	0.730
AFA	B	Cd	11.6	4.22
CGD	B	Sb	5.23	11.1
CGD	B	Mo	5.23	9.42
CGD	C	Cd	8.98	1.17
DGD	C	Cr	9.03	24.3
NAW	A	As	7.25	10.2
NAW	B	Pb	5.39	9.32