

November 19, 2013

Cummins Surveillance Panel Conference Call

Attendance:

Intertek – Jim Moritz, Adam Roig
TEI – Zack Bishop
Afton – Bob Campbell
SwRI – Martin Thompson
Cummins – Dan Nyman
Infineum – Bob Salgueiro, Elisa Santos, Jim Gutzwiller
Lubrizol – Jim Matasic, Nick Secue, Kevin O'Malley
Oronite – Jim Rutherford, Mark Cooper
TMC – Sean Moyer, Jeff Clark
Volvo - Greg Shank

Injector Adjusting Screw Results on new ISM Hardware Batch Reference Runs:

This conference call was essentially a continuation of the November 14, 2013 conference call during which the new ISM hardware was approved for use. The main focus of this call was to address an apparent step change in severity of Injector Adjusting Screw Weight Loss and to determine what course of action to take to resolve the issue. It was previously noted that the severity change may predate the newest hardware, and may be associated with a new push rod batch that was introduced with engine kit 571.

Jim Rutherford provided an analysis of the data (see attachments). Jim reviewed the new parts of the analysis (added since last week's meeting). It was noted that square root transform appears to be the best, with a suggested CF of -0.581. It was worth noting that the current data is significantly different than the 19.1 CF data, but isn't significantly different than the tests that had no CF.

Further discussion focused on the push rods as a likely root cause of the IAS severity change (refer to slide 27 of Jim's presentation). For going forward, it was decided to use the most recent six tests to derive the IAS CF as this will encompass both the new injector screws and the push rod batch that was introduced earlier. Slide 21 of the presentation shows three possible options of CFs using these tests (arithmetic, square root, natural log). Jim felt any of these options would accomplish what was needed.

Bob Campbell asked if we could begin a conversation with the supplier regarding the push rods to find ways to eliminate the scratching issues that have been seen. Dan Nyman agreed to take this task on and Zack Bishop agreed to help also.

Returning to the IAS CF discussion, and after much Q & A, the group was circling in on using the natural log transform CF. ***It was moved and seconded (Campbell, Matasic) to use a natural log transformation for IAS with a CF of -0.200 for all ISM tests on the new hardware combination (Batch B injector push rods, Batch D injector screws, Batch E crossheads); kit number 673 was the first kit issued with this combination. This motion passed without objection and with two waives (TEI, TMC).*** It was agreed that the current forms and reporting structure methods would be used for reporting the results (bring forward the soot adjusted IAS value, in mg, from Form 12 to Form 4. Then transform, implement the correction factor and back-transform that sum for the final result).

Reporting of ISB and ISM Hardware Information:

Sean Moyer requested adding hardware information to the report packets for both ISM and ISB. It was agreed to add this information to the measurements pages as needed. Sean will make the forms and data dictionary changes and submit for industry beta testing. TEI will make sure all relevant items will have the batch identifiers shown in the kits.

Replacement of 5.9L ISB:

Jim Moritz noted that Dan Nyman of Cummins is working on a replacement for the 5.9L ISB and this will be a panel business item in the future.

The call concluded at 3:45 p.m.

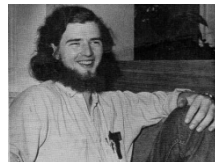


Oronite

ISM Industry Correction Factors

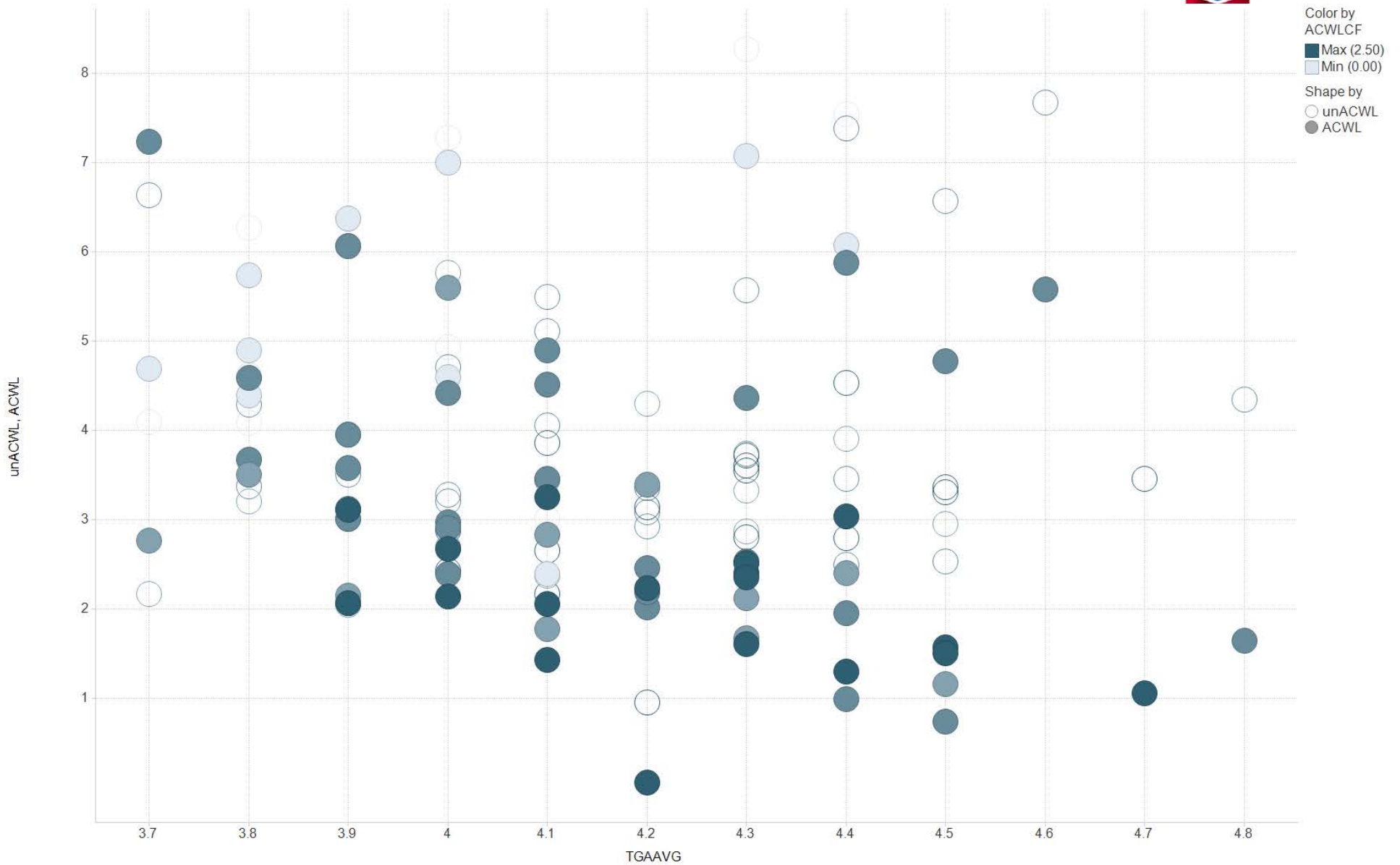
Jim Rutherford

11/18/2013



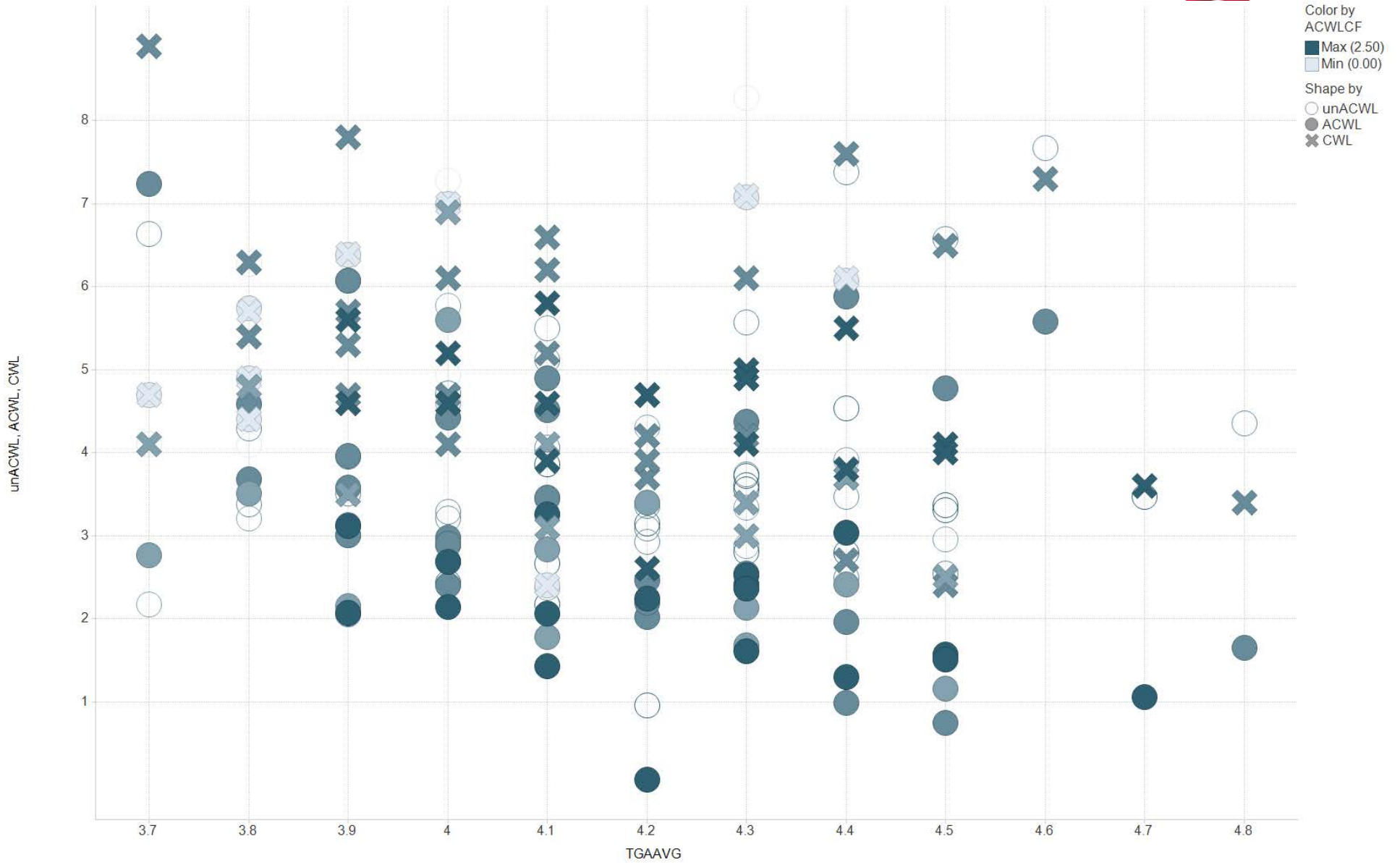


Oronite



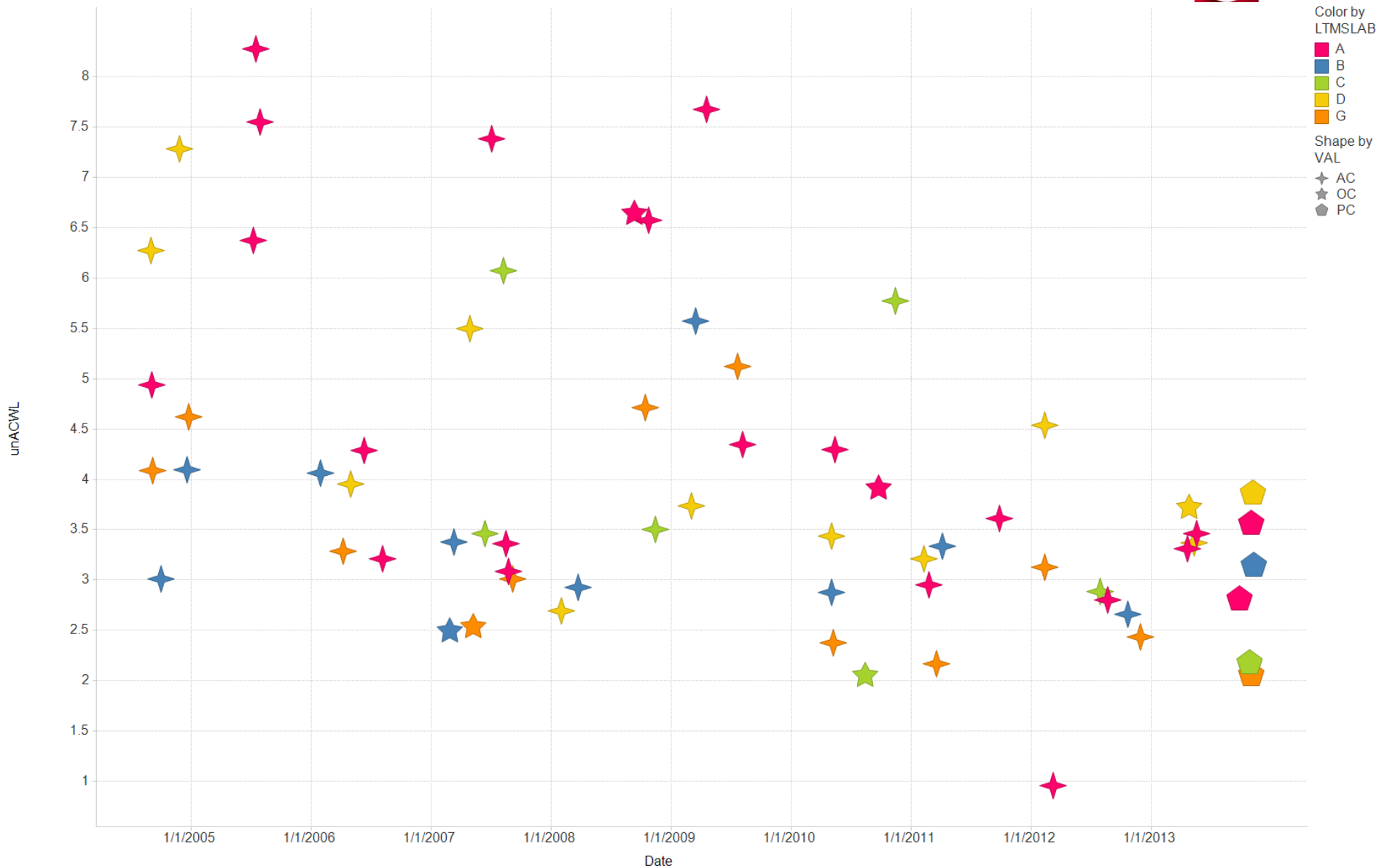


Oronite



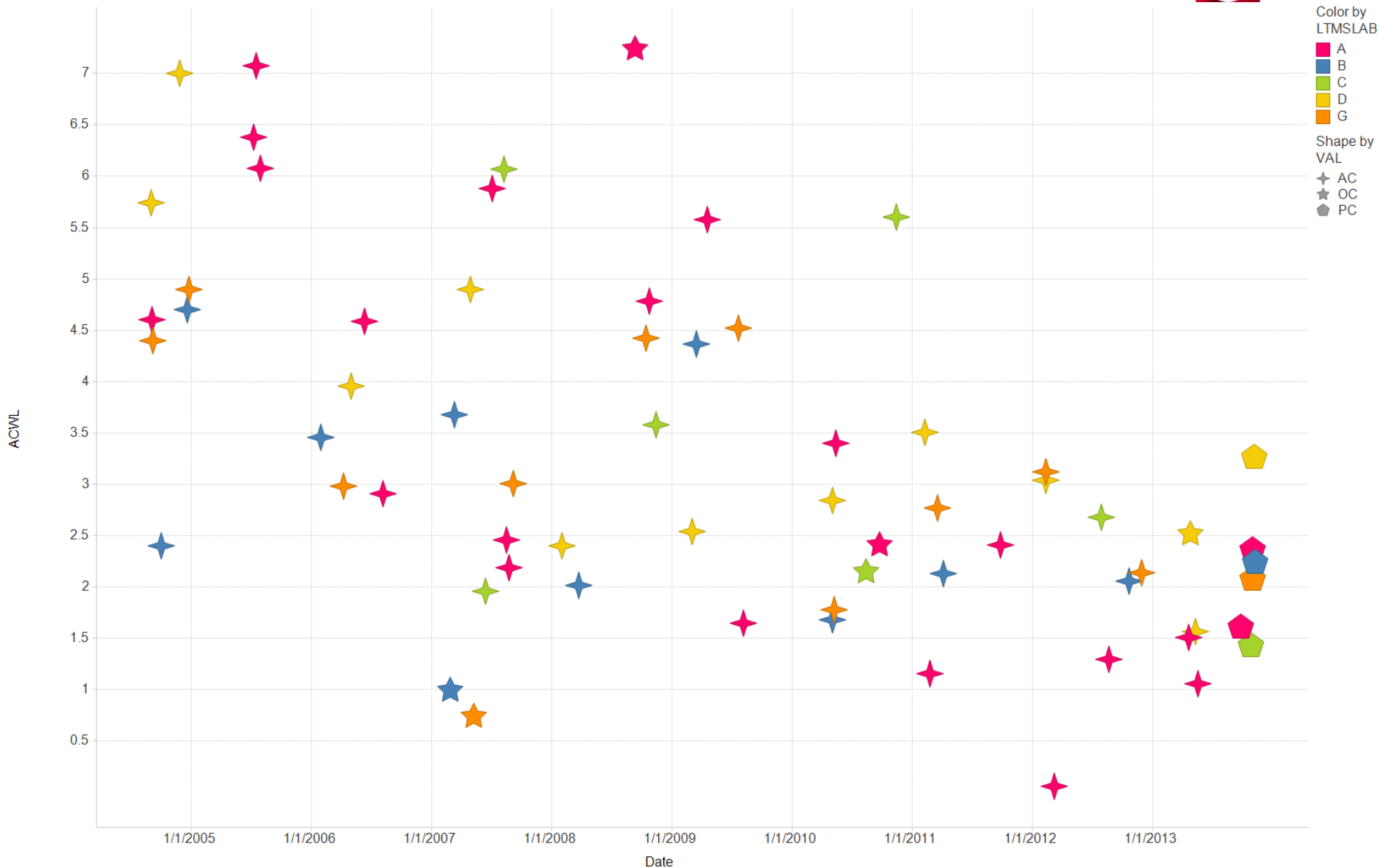


Oronite



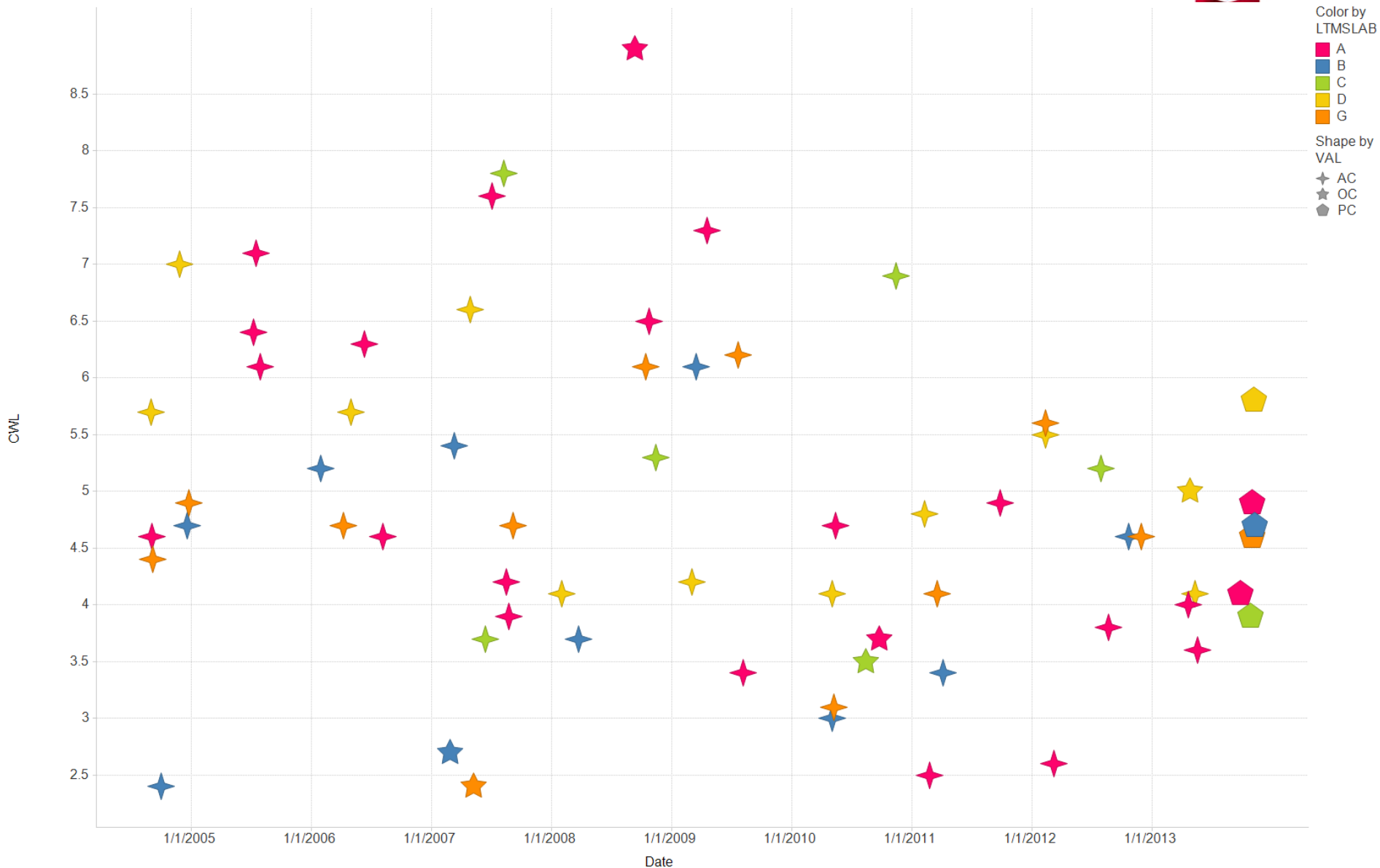


Oronite



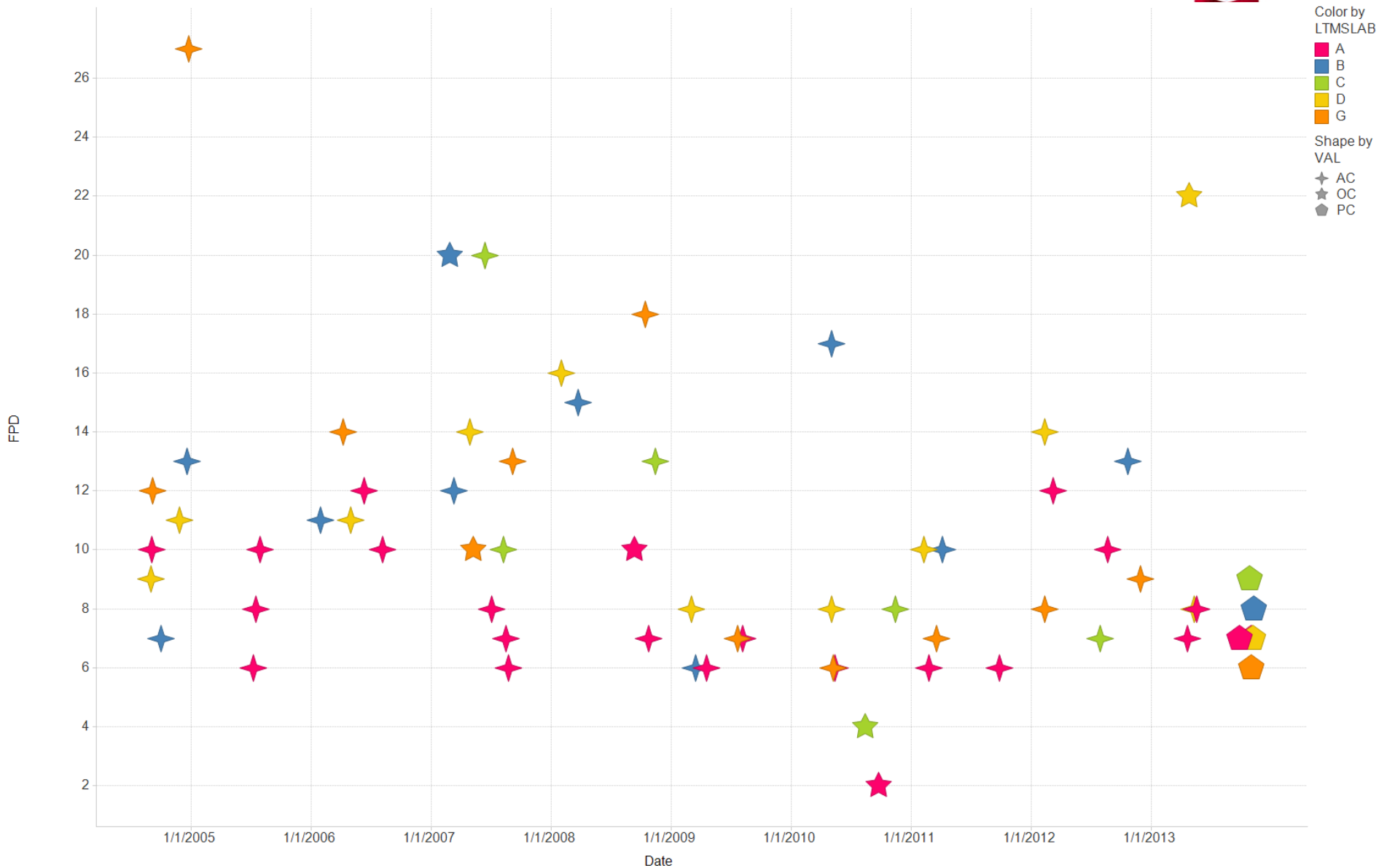


Oronite



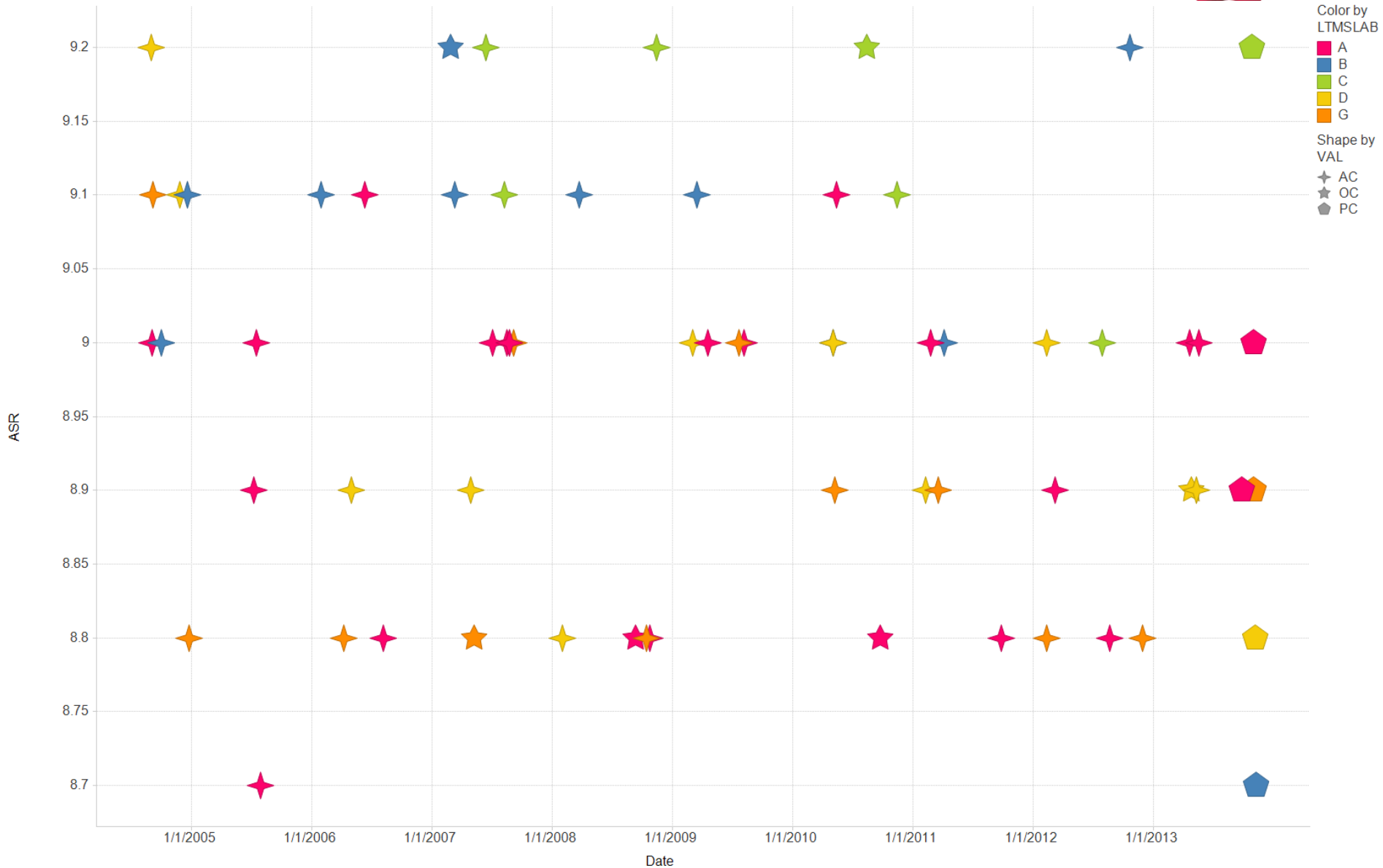


Oronite





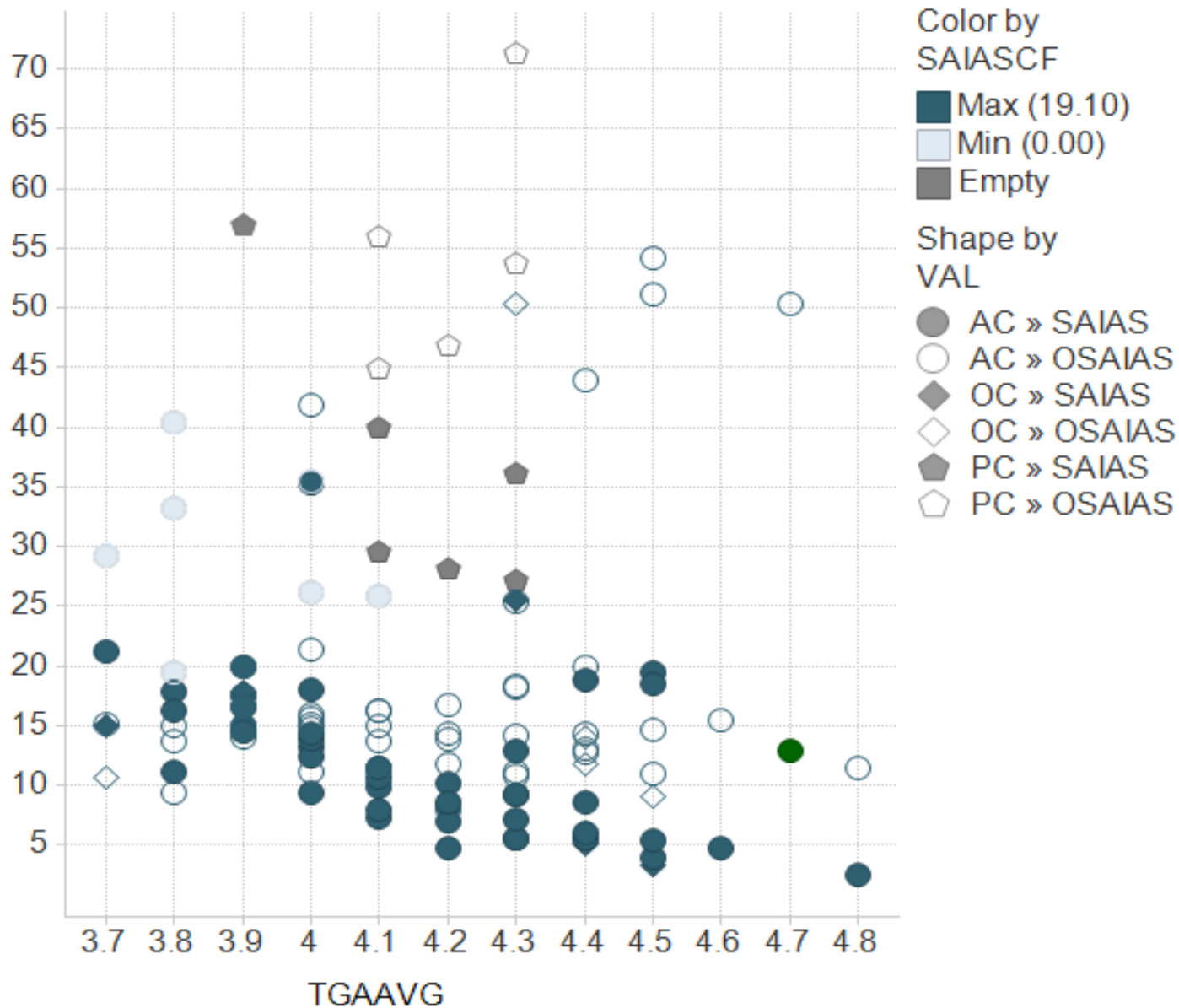
Oronite





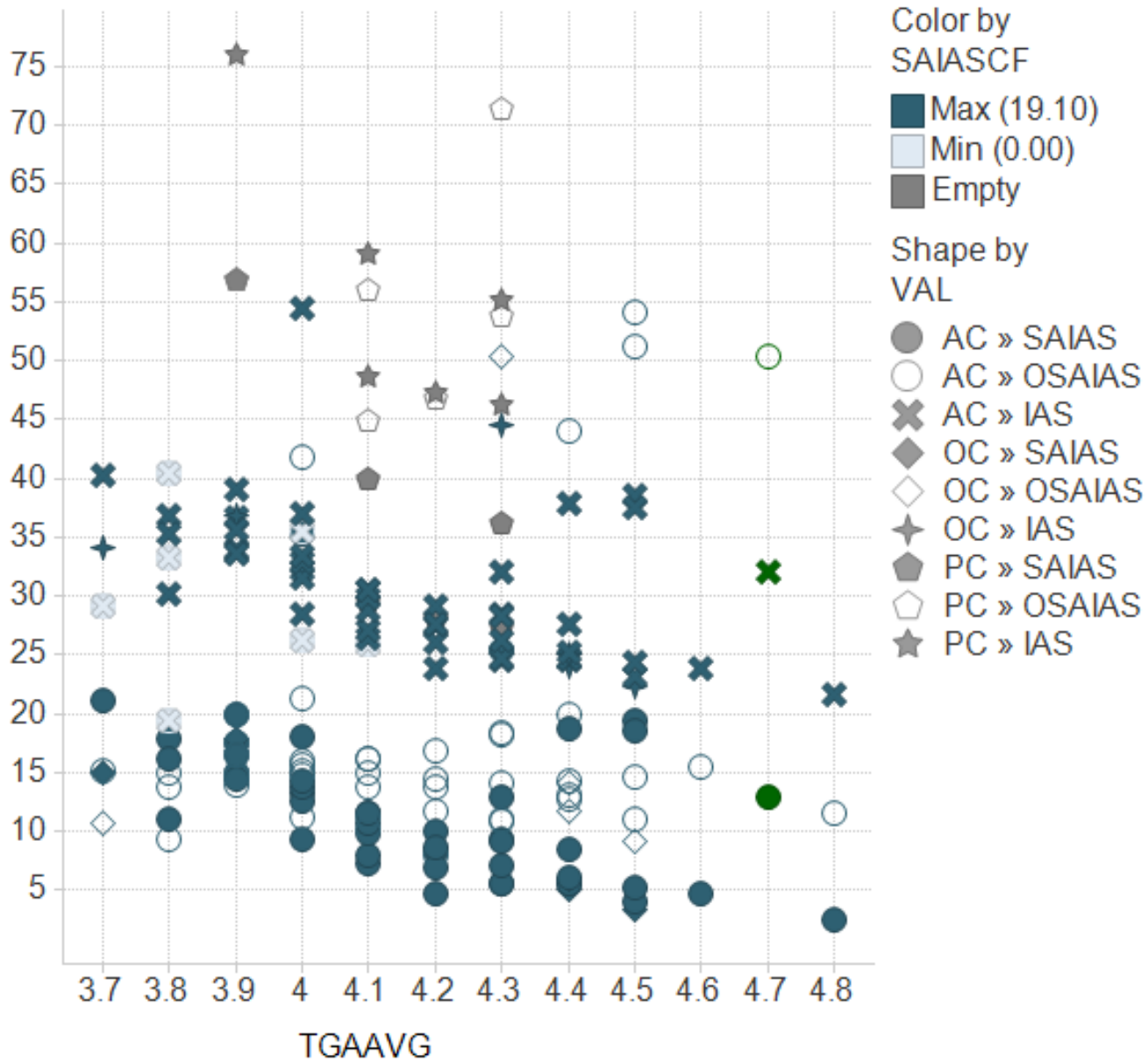
Oronite

SAIAS, OSAIAS



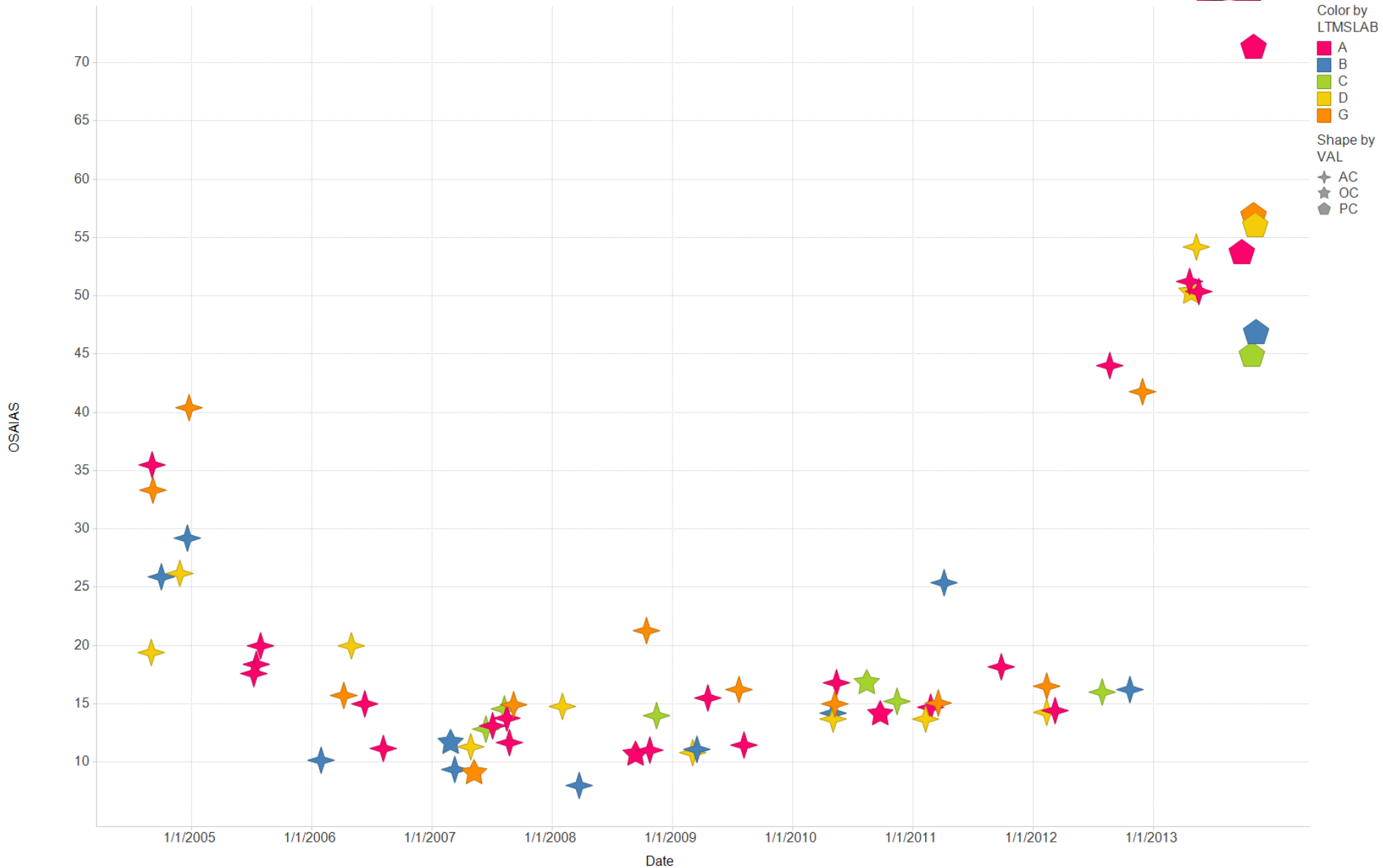


SAIAS, OSAIAS, IAS



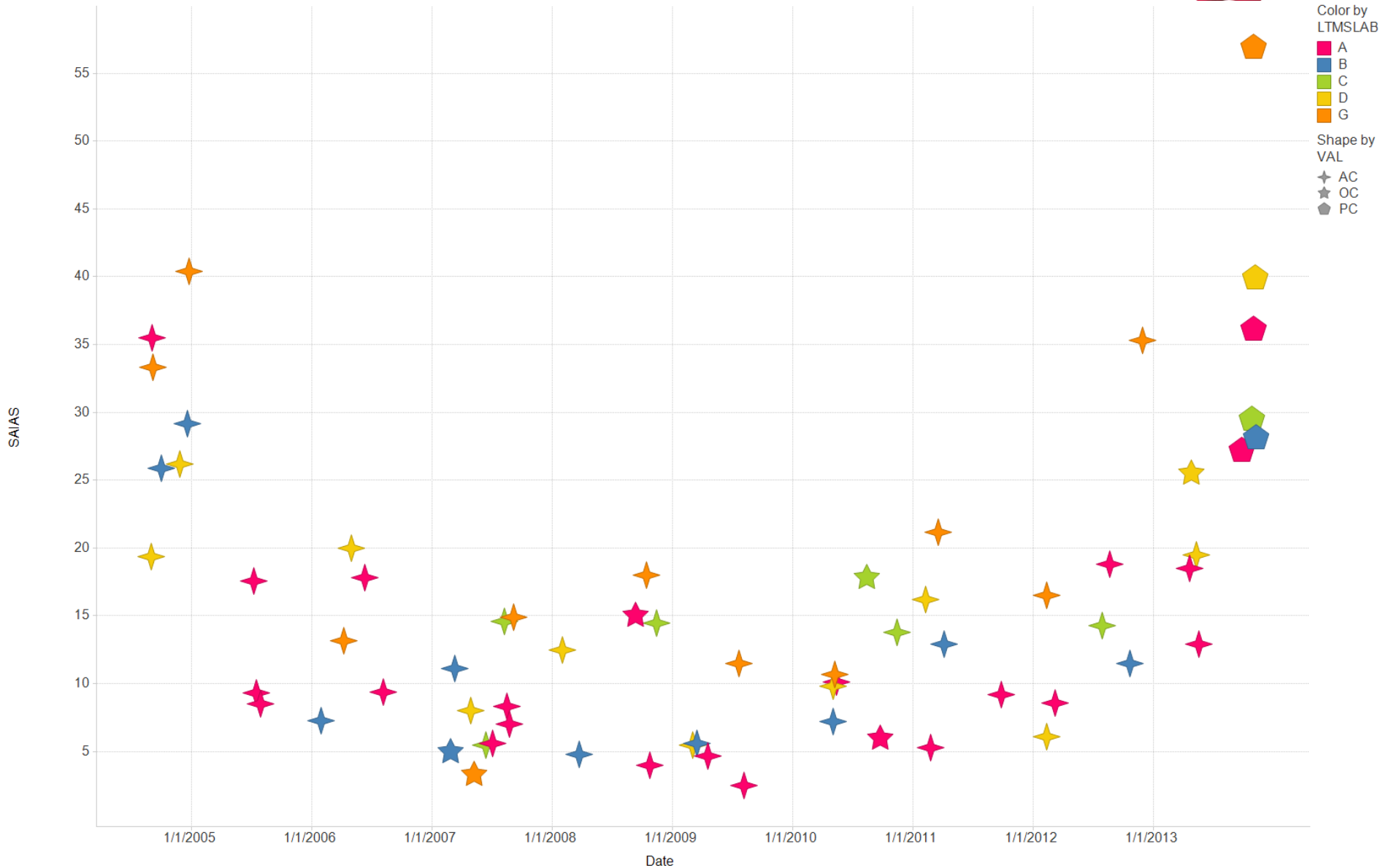


Oronite



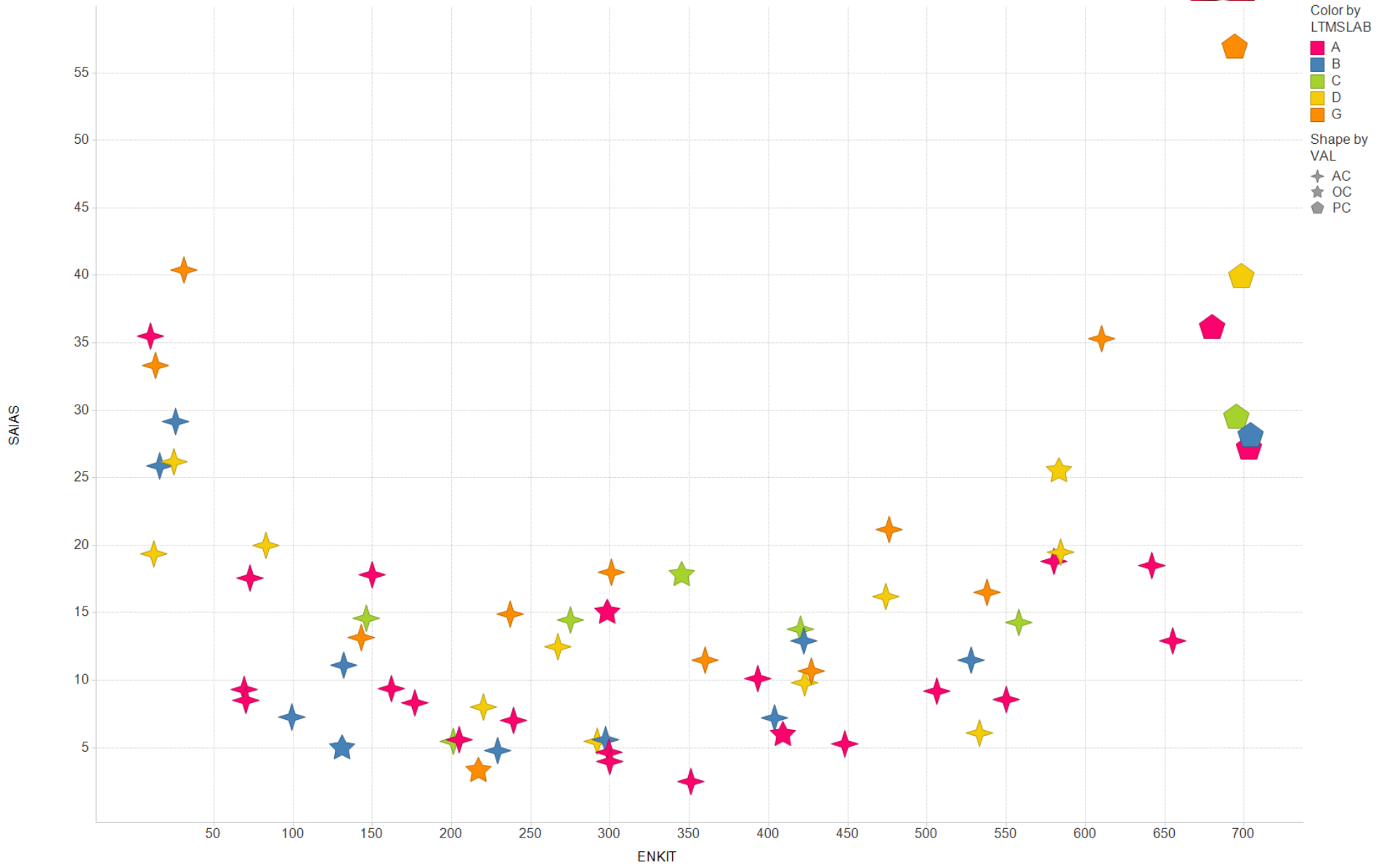


Oronite



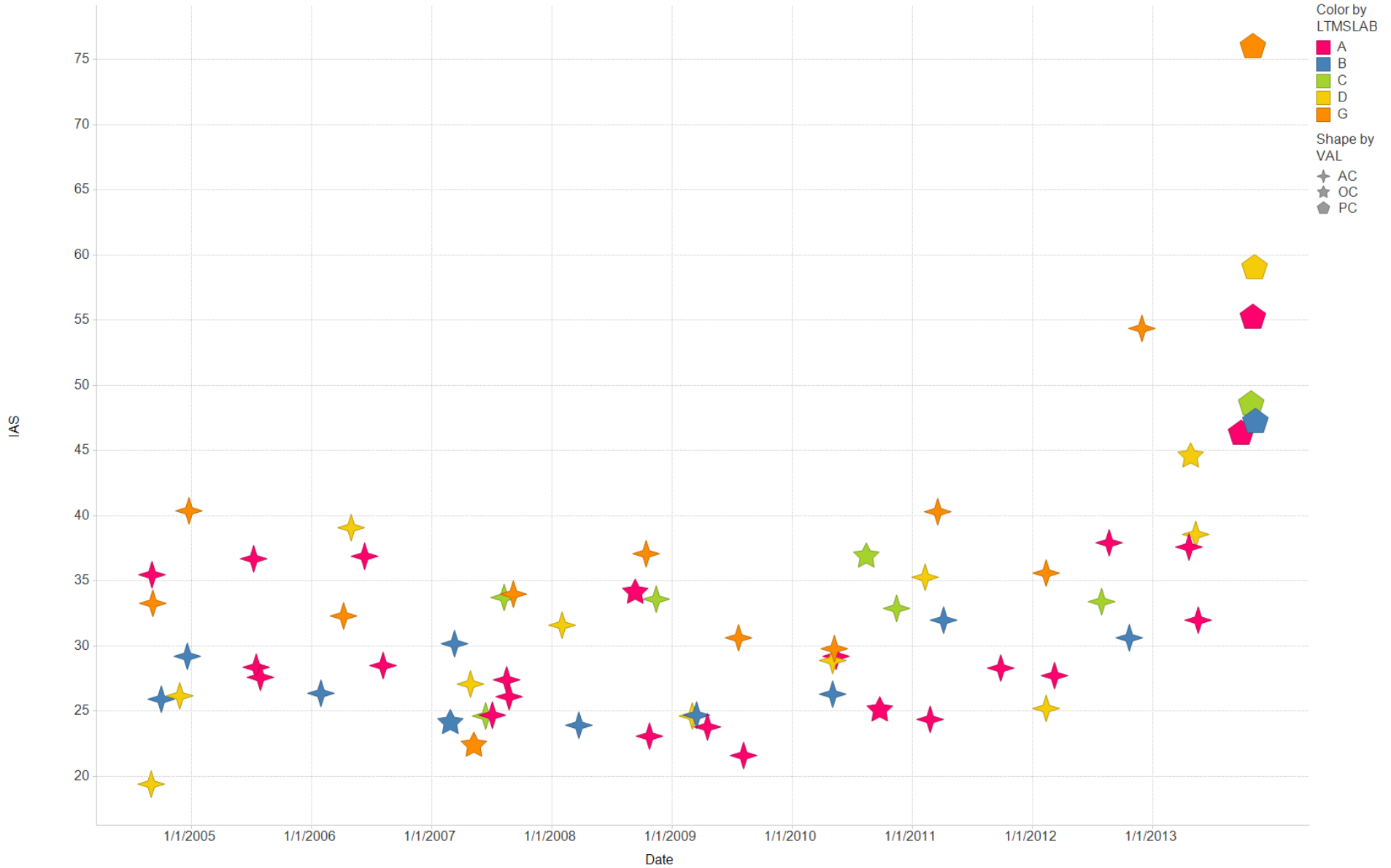


Oronite



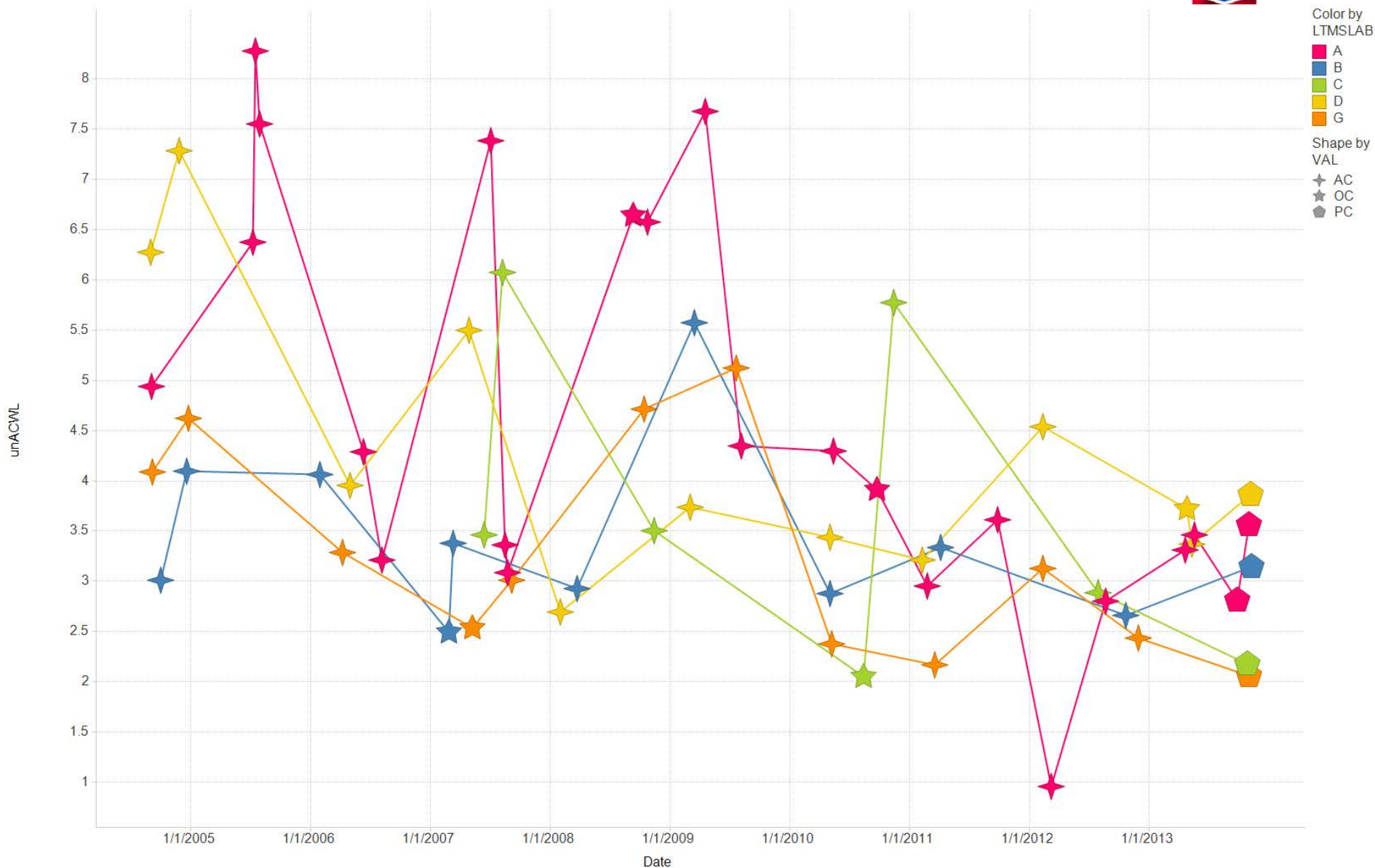


Oronite



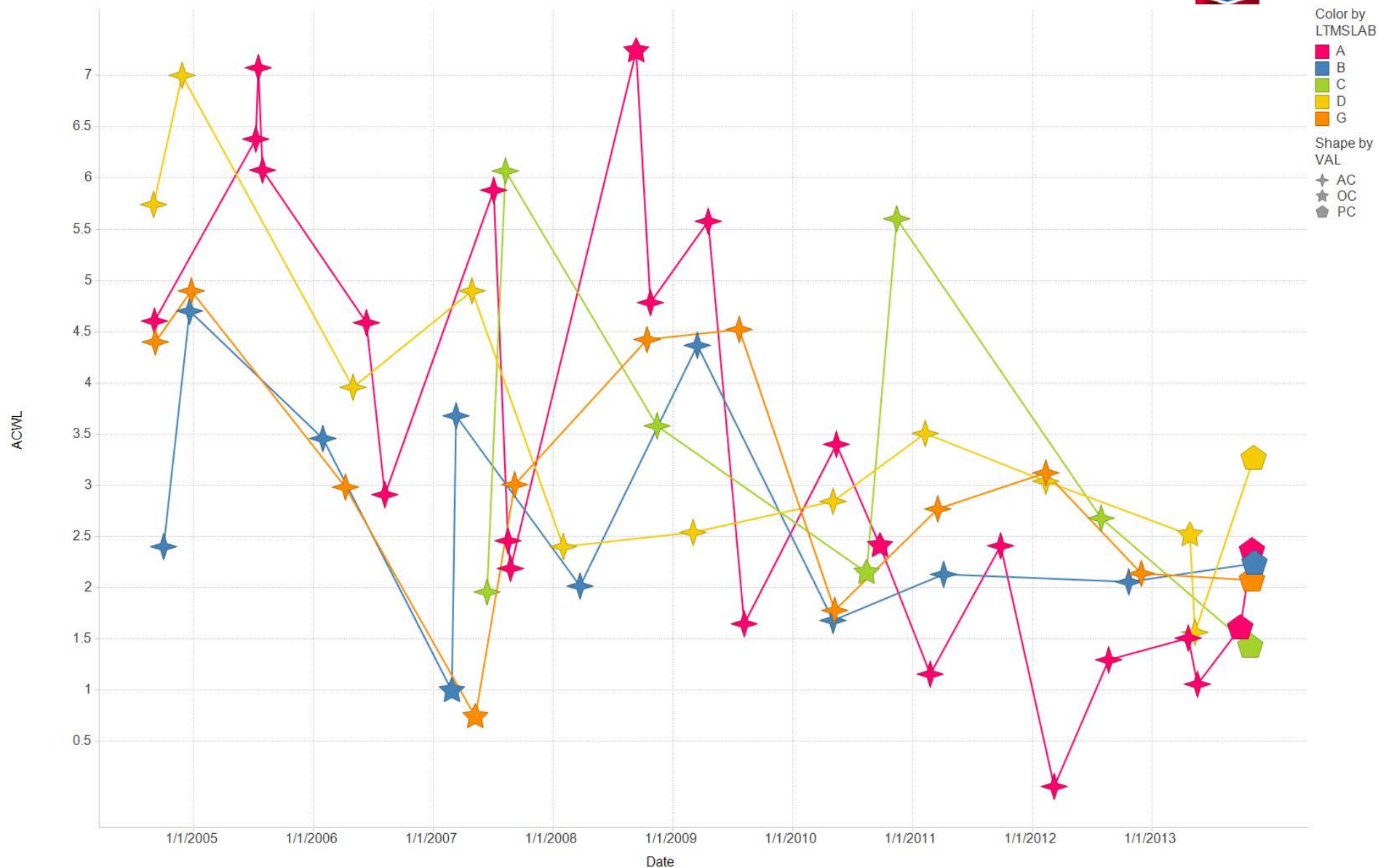


Oronite



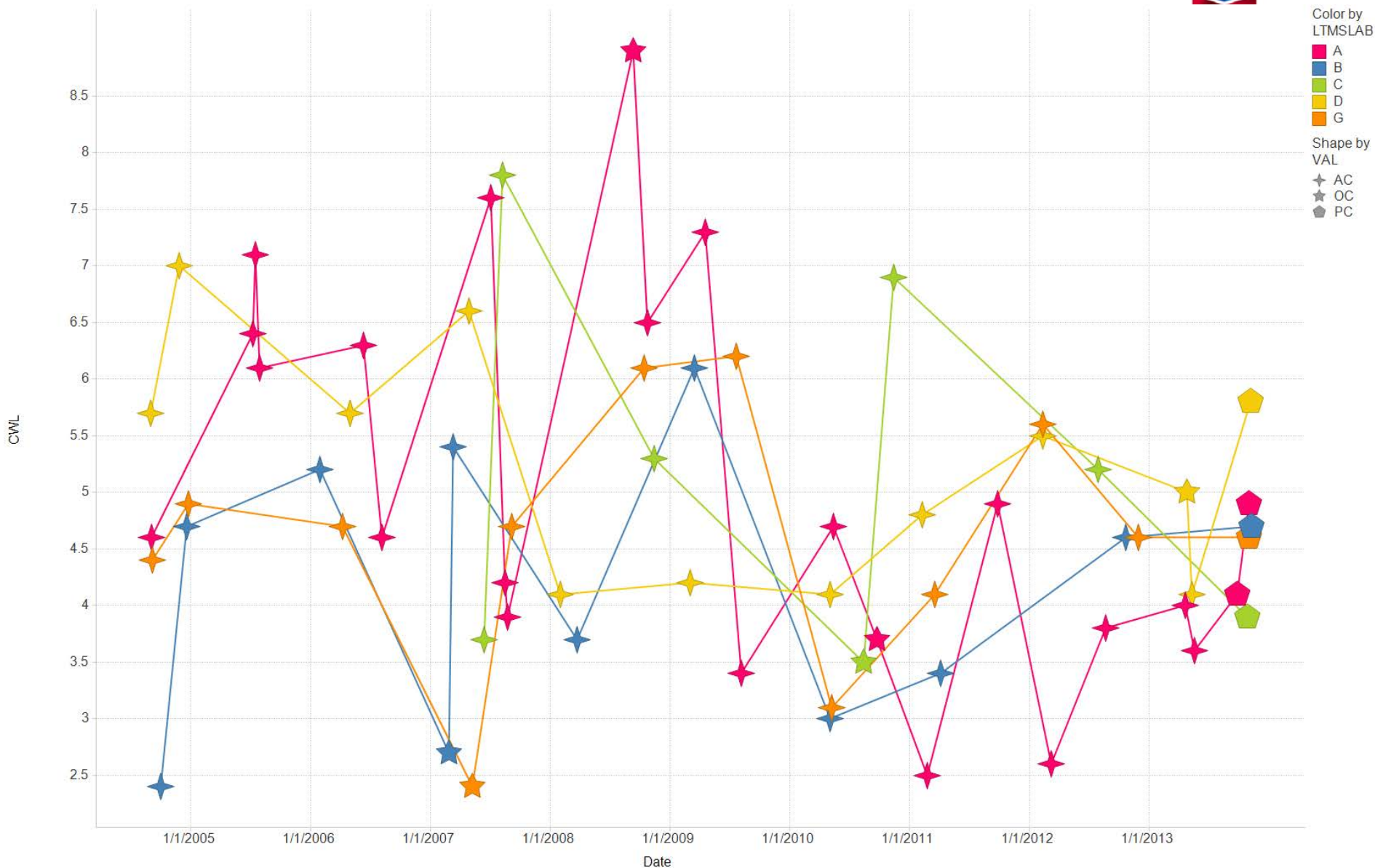


Oronite





Oronite



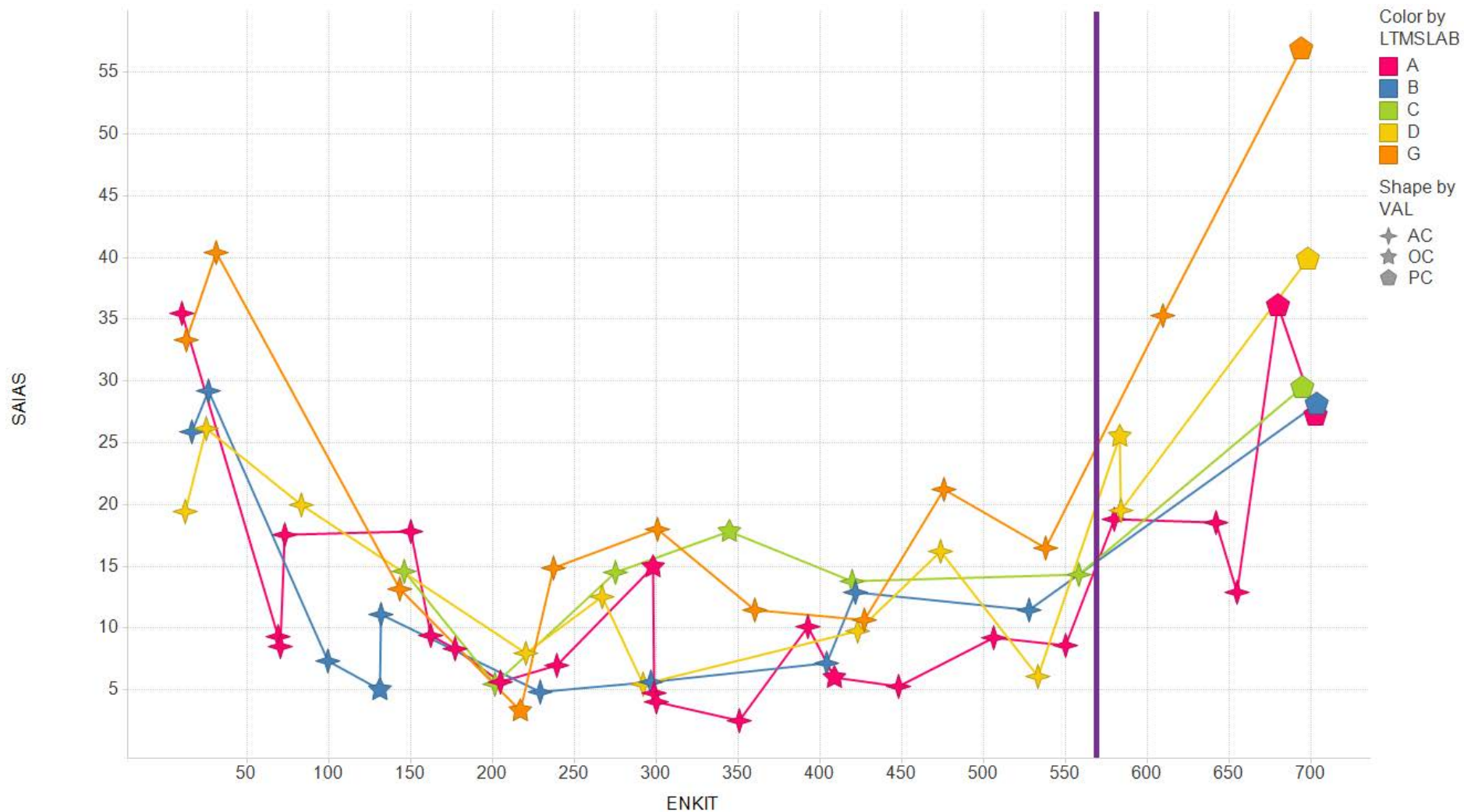


Oronite





Oronite





Box-Cox Transformation of saias in Dataset ism.Itms20131112

“Best” is square root, significantly different from log and no transformation

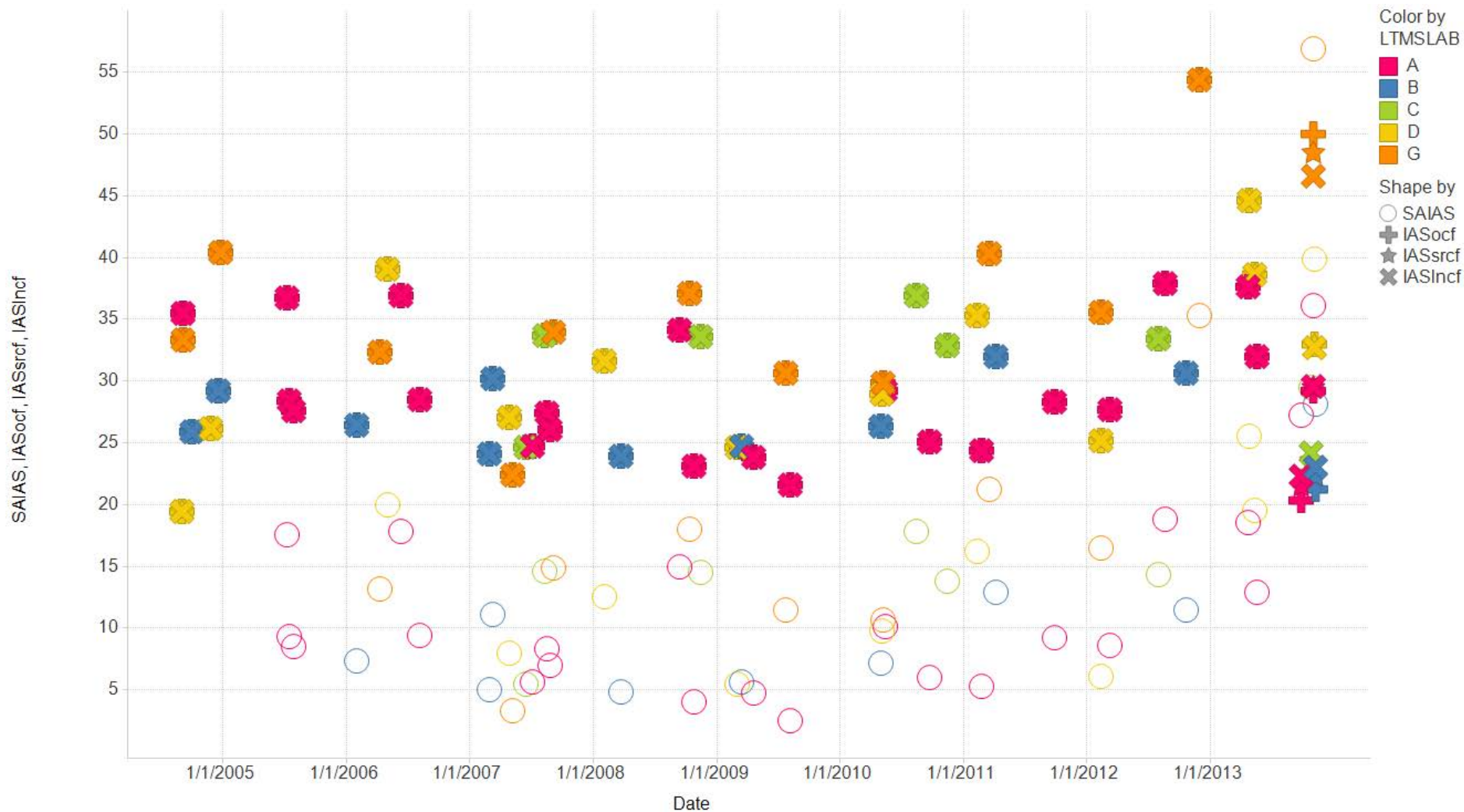
Obs	rmse	LAMBDA	confint	21	6.3568	0.0	
1	25.5834	-2.0		22	6.1840	0.1	
2	23.1082	-1.9		23	6.0463	0.2	
3	20.9308	-1.8		24	5.9434	0.3	*
4	19.0138	-1.7		25	5.8753	0.4	*
5	17.3247	-1.6		26	5.8431	0.5	Best
6	15.8352	-1.5		27	5.8483	0.6	*
7	14.5207	-1.4		28	5.8931	0.7	*
8	13.3598	-1.3		29	5.9805	0.8	*
9	12.3340	-1.2		30	6.1142	0.9	
10	11.4270	-1.1		31	6.2984	1.0	
11	10.6248	-1.0		32	6.5385	1.1	
12	9.9151	-0.9		33	6.8400	1.2	
13	9.2874	-0.8		34	7.2099	1.3	
14	8.7326	-0.7		35	7.6555	1.4	
15	8.2428	-0.6		36	8.1855	1.5	
16	7.8112	-0.5		37	8.8095	1.6	
17	7.4321	-0.4		38	9.5383	1.7	
18	7.1007	-0.3		39	10.3844	1.8	
19	6.8131	-0.2		40	11.3618	1.9	
20	6.5659	-0.1		41	12.4867	2.0	



ACWL CF	ACWL LSMEAN	0	1.3	1.7	2.5	tbd	cf
0	5.39542661		2E-04	0.006	<.0001	2E-04	
1.3	2.66325624	2E-04		0.295	0.611	0.936	2.7
1.7	3.60431179	0.006	0.295		0.004	0.12	1.8
2.5	1.86334819	<.0001	0.611	0.004		0.994	3.5
tbd	2.1393031	2E-04	0.936	0.12	0.994		3.3
SAIAS CF	SAIAS LSMEAN	0	19.1	tbd			
0	29.7059998		<.0001	0.135			
19.1	12.150698	<.0001		<.0001			17.6
tbd	36.6317644	0.135	<.0001				-6.9
SAIAS CF	srSAIAS LSMEAN	0	19.1	tbd			
0	5.43677245		<.0001	0.424			
19.1	3.37335843	<.0001		<.0001			2.063
tbd	6.01766615	0.424	<.0001				-0.581
SAIAS CF	InSAIAS LSMEAN	0	19.1	tbd			
0	3.38589713		<.0001	0.757			
19.1	2.36104351	<.0001		<.0001			1.025
tbd	3.58568923	0.757	<.0001				-0.200

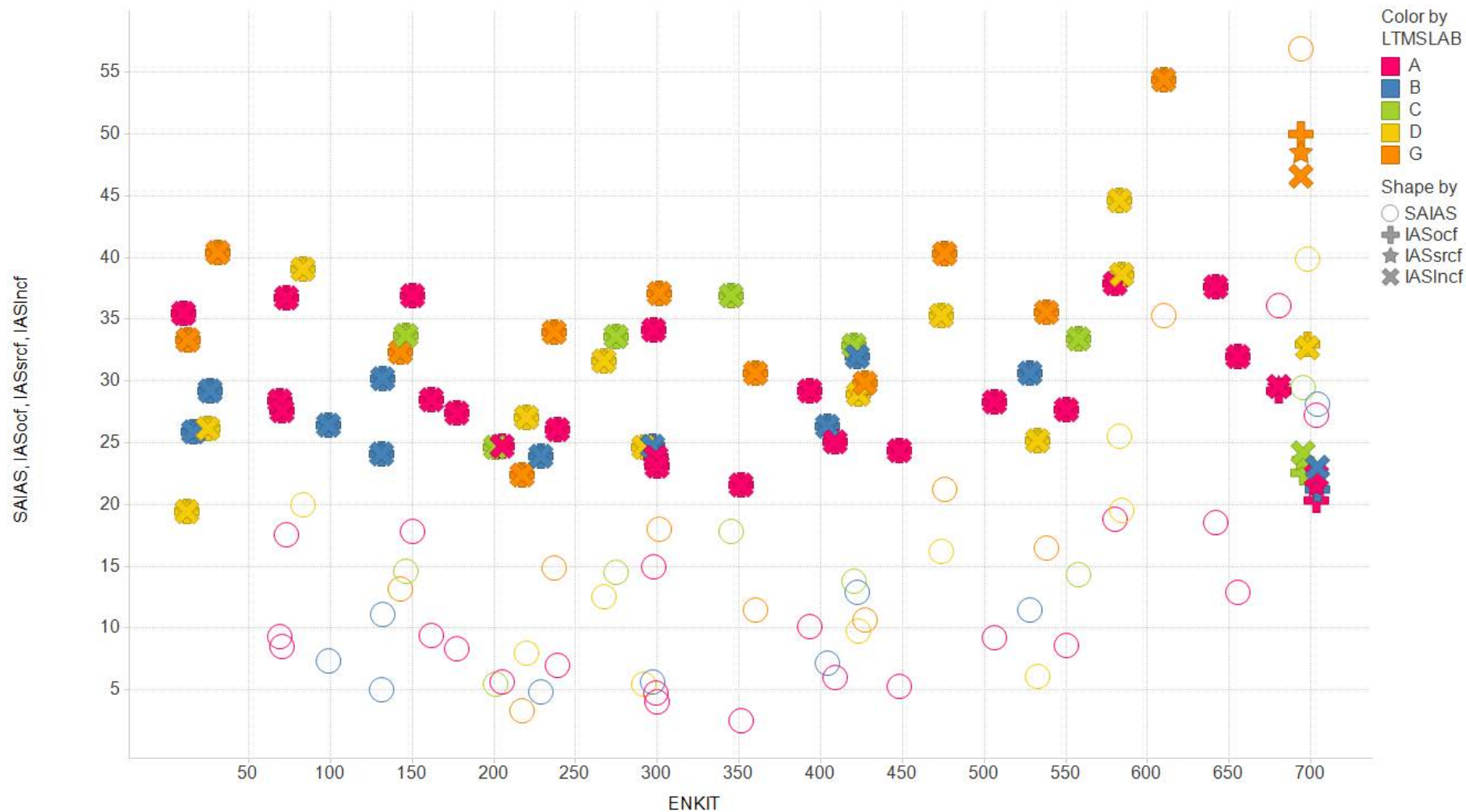


Oronite



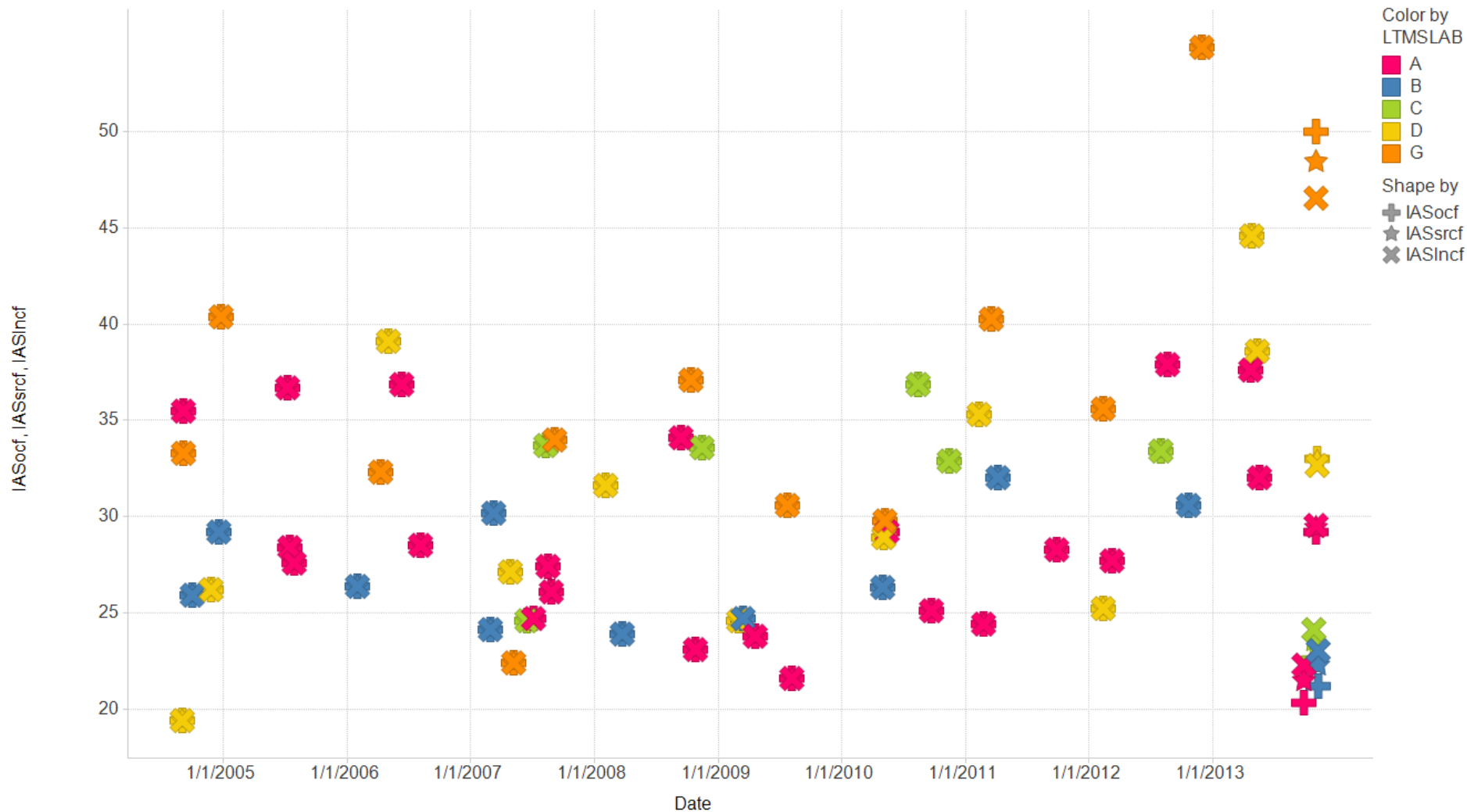


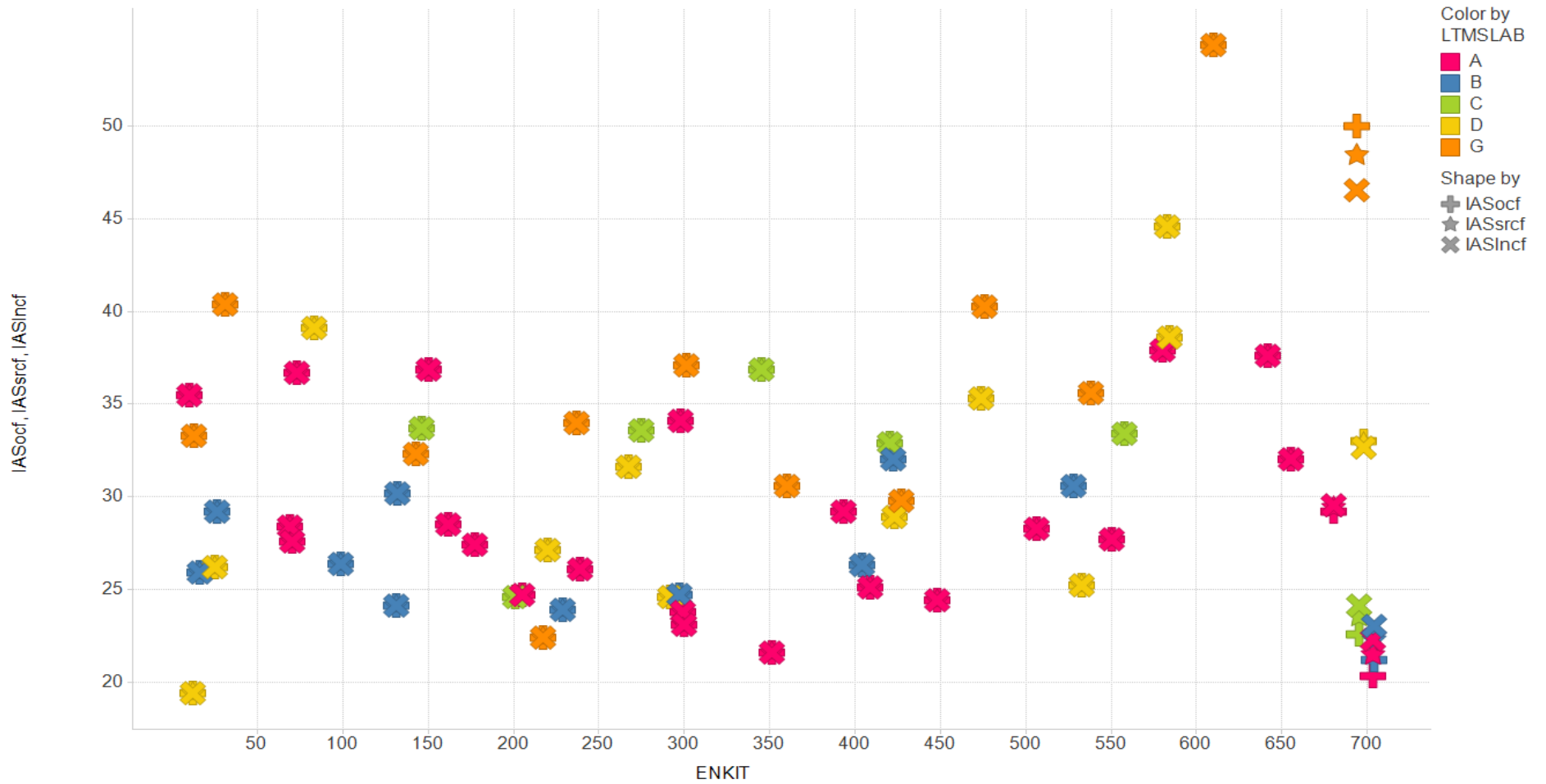
Oronite





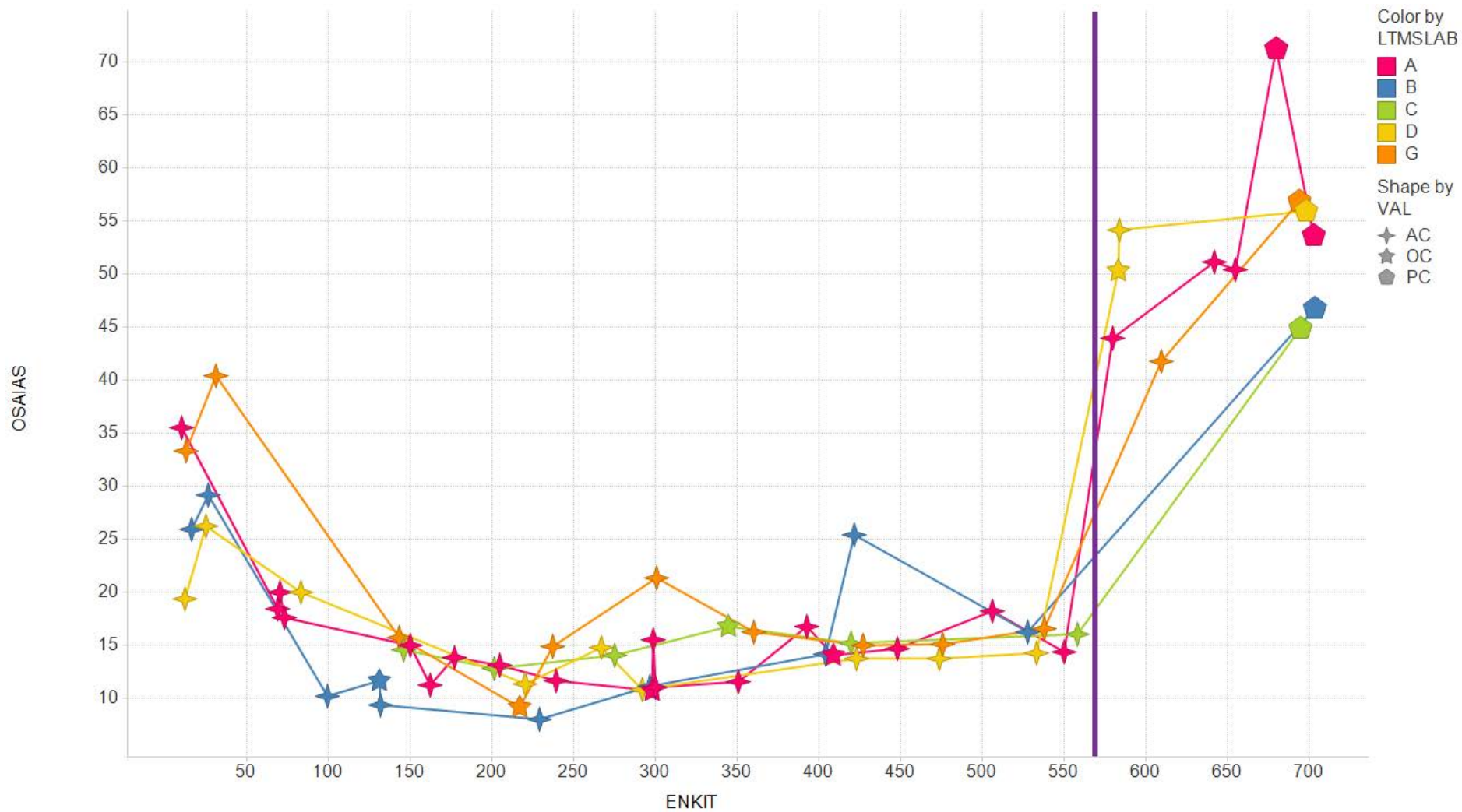
Oronite

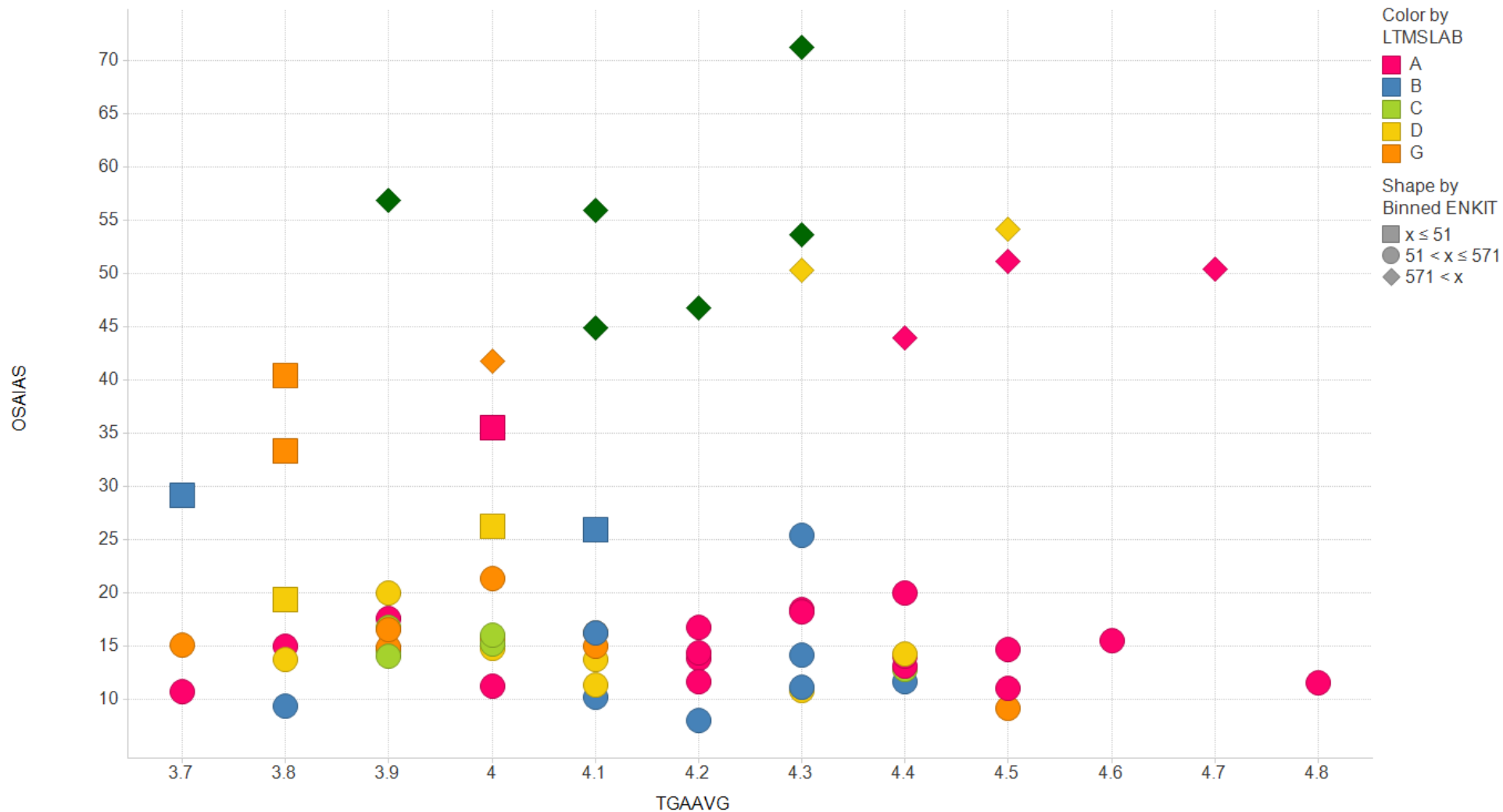






Oronite







Oronite

