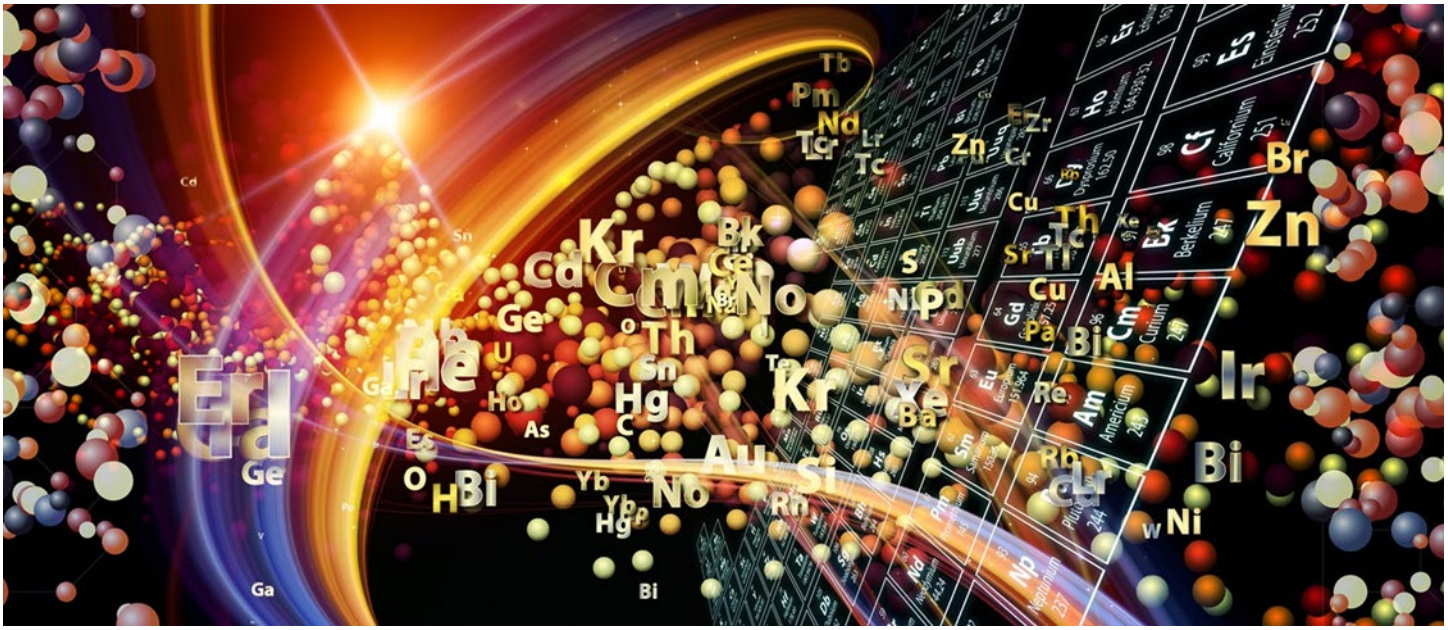


OLI Software Release Notes V11.x

Jim Berthold

9/6/23

Contents

Introduction

For many years, the OLI software release notes were maintained on several different web pages. While this was suitable at the time it has become far too cumbersome to maintain.

With the release of OLI Software V9.6 the release notes have been combined into a single document.

Each version will be listed in reverse chronological order. Within each version update to the products will be listed in this order:

- Databank updates
- Databank fixes
- Engine/solver
- OLI Studio/Analyzer
- OLI Flowsheet: ESP
- OLI Chemistry Wizard
- OLI Developer Edition
- OLI Alliance products
    - Aspen Hysys
    - Aspen Plus
    - gProms
    - IDEAS
    - Petro-Sim
    - ProII
    - Unisim Design
- OLI Security/License Manager

Version 11.5.1.9

General Information

There were two primary reasons for this version's release. The first and primary reason was that the digital signature of all the OLI installation files expired on August 23, 2023. This means that when installing version 11.5.1.7 after that date there could be a virus detection (false) by some anti-virus software. All the OLI software installation files were re-digitally signed.

The second reason is that the OLI databook program had some errors introduced to it that caused it to be unusable for those users managing their own data.

Product	Release Date
OLI Studio/Analyzer (x64)	September 01, 2023
OLI Flowsheet: ESP / ESP FS[1] (x64)	September 01, 2023
Chemistry Wizard	September 01, 2023
OLI Developer Edition (x64)	September 01, 2023
OLI Engine 11.x for Aspen Hysys (x64 bit)	September 01, 2023
OLI Engine 11.x for Aspen Plus (x64 bit)	September 01, 2023
OLI Engine 11.x for Petro-Sim (x64 bit)	September 01, 2023
OLI Engine 11.x for ProII (x64)	September 01, 2023
OLI Engine 11.x for Unisim Design	September 01, 2023
OLI License Manager[2] (x64 bit)	September 01, 2023
OLI Engine 11.x for gProms (x64 bit)	September 01, 2023

OLI Engine 11.x for IDEAS was not updated for this release

[1] The product ESP FS is for Asia releases. It is functionally identical to OLI Flowsheet: ESP.

[2] This product does not follow the same versioning scheme as the other products. The current version is 5.0.1.5

Databank Updates

Mixed-solvent electrolyte (MSE) databank

All the updates from version 11.5.1.8 were included in this release.

OLI Databook – Bugs & Features & Resolved issues.

Bug ID	Problem	Resolution
OS-4221	Sorption K's not exporting correctly	Updated code to put 0's in all of the fields in a category if any data is entered the following fields in the Vapor/Solid/Liq chapters and the Sorption chapter were updated CP/VP/KFIT/SorptionData
OS-4362	OLI Databook has problems naming species, possibly due to name ending in -in (Albumin)	Updated save of species record to check tag name for basic rules. Start with only a letter A-z Contain A-Z 0-9 and period for rest of name Do not allow to end in 'IN'
OS-5215	Copying Material code record does not copy volume or Mol Wt	The code was using old_core::String which is multi byte in 64-bit which was causing the issue. Updated to use std::string for the write operation.
OS-5240	Importing a species into a DB to replace does not replace it	Identified issue causing existing species not to be imported. A change to how we handle importing to speed up full databank creation inadvertently caused this issue. Updated code to pass a flag to allow updating in the case of import into an existing databank.
OS-5254	PFLG is missing when Copy/Paste a species from MSEPUB to a private DB. Example: SULFUREL, C8H18, etc. (Export/Import works) CLAS is missing when Copy/Paste from MSEPUB to a private DB (Export/Import works) The next problem is about removing the Aqueous section for a species. Let us assume that a species has an Aqueous section in addition to the General Info, Vapor and/or Solid sections in MSEPUB or a private DB. We decided to remove the Aqueous section and we are exporting this species, deleting the Aqueous section and importing it again to our private DB (by importing the *.A01 file). The Aqueous section has not been removed from our updated DB, it is still there. Copying solids, which have three tables pertaining to the Scaling Kinetics (e.g., BASO4, CASO4) from MSEPUB to a private DB does not paste these table to this private DB. It looks like it appears for a microsecond. It is not possible to Export/Import the Redox for an individual species (e.g., AGEL_RD). All other functions, Copy, Paste, Save, Close, Revert, Delete) are there. The interaction parameters copied from the Interactions chapter in MSEPUB and pasted to a private DB are truncated. It looks like only 6 significant digits remain after pasting them. We are concerned that many sensitive systems (e.g., with LLE) may be affected by losing accuracy. Keeping more digits will be much safer. Export/Import does not have this issue. There is a problem with changing Molar Volume in the Solid section. We need to show this to you through Teams because it is not reproducible.	PLFG now included in copy CLAS not included in copy Updated code when importing to delete unused entries (aka Aqueous chapter in this example) Also requires change in OLISQLiteDataProvider Induction time info is copied (except for related solids) but will only be pasted if the databank was created in 11.5 and has the fields available. If they don't show on screen they databank is from a previous version. Updated export to increase precision Found issue with data evaluation dialog not picking up changes consistently, this is fixed. Will open a new ticket if this is not the issue. Fixed copy/paste of heat capacity Metric units were changed in version 11.0.1 (base default unit sets are shared between products) to be joule for metric unit set. Updated databook to override this to be consistent with old blue sc… * Merged in CD-OS-5254 (pull request #79) The issue was the bounding box for the text was too small (resolution will impact this), increased box to allow plenty of room. Updated to change period in species name to be dash in filename, also add conversion to other common characters not allowed in file names (Ex: /*?<>)| for literature ref names

	Trying to Copy/Paste coefficients for heat capacity of a solid from MSEPUB to a private DB (or vice versa) does not work. No star appears after pasting and the values do not stick. Units Manager under Tools does not recalculate units from SI to Metric but it does recalculate them from SI to English. In this way, units for ΔG and ΔH, So and Cpo are recalculated at once. For now, we can go around it by changing ΔG and ΔH and/or So and Cpo separately. Energy units for MEtric should be cal not Joule 10. In the Material Codes chapter, the last item is described as Liquid, it should be Liquid Volume (only on Jiangping's screen), it shows Liquid Volume. (Maybe, it is related to the screen resolution???) 11. If an anhydrous solid (e.g., LI2SO4) is exported, LI2SO4.A01,02, 04,19 have the correct name. If the hydrate of LISO4.H2O is exported, the files show the same name LI2SO4.A01,02,04,19 instead of LI2SO4.H2O.A01, etc. Probably because of two dots??? For now, we have to remember to rename these species.	

Engine/Solver - Features

Bug ID	AREA	Problem	Resolution
		No new features for this version 11.5.1.9	

Engine/Solver - Bugs

Bug ID	AREA	Problem	Resolution
		No new bugs unique to all products for this version 11.5.1.9	

OLI Studio/Analyzer - Features

Bug ID	AREA	Problem	Resolution
		No new features for this version 11.5.1.9	

OLI Studio/Analyzer - Bugs

Bug ID	AREA	Problem	Resolution
		No new bugs unique to all products for this version 11.5.1.9	

OLI Flowsheet: ESP / ESP-FS - Features

Bug ID	AREA	Problem	Resolution
		No new features for this version 11.5.1.9	

OLI Flowsheet: ESP / ESP-FS - Bug

Bug ID	AREA	Problem	Resolution
		No new bugs unique to all products for this version 11.5.1.9	

Alliance Products - Features

Bug ID	Program	Problem	Resolution
		No new features for this version 11.5.1.9	

Alliance Products - Bugs

Bug ID	Program	Problem	Resolution
		No new bugs unique to all products for this version 11.5.1.9	

OLI Chemistry Wizard (all products)

Bug ID	Program	Problem	Resolution
		No new bugs unique to all products for this version 11.5.1.9	

OLI Developer Edition - General

Bug ID	Program	Problem	Resolution
		No new bugs unique to all products for this version 11.5.1.9	

OLI Framework - General

Bug ID	Program	Problem	Resolution
		No new bugs unique to all products for this version 11.5.1.9	

Version 11.5.1.8

Release Date

June 9, 2023

General Information

This is a database only release. Starting with this version, OLI is no longer only releasing the databases with the release of the mainline software. As updates become available, the OLI databases will be released independently.

This release is 11.5.1.8 but the OLI Databook program will show 11.5.2 as the internal version. This is a limitation of the OLI databook program.

MSE Public Database (MSEPUB)

All species names are in OLI Tag format.

Lithium chemistry

Species:

No.	OLI Tag Name	Chemical Formula	Empirical Formula	Action
1	KLICL2	KLiCl2	Cl2KLi	New
2	KLICLA	K0.75Li0.25Cl	ClK0.75Li0.25	New
3	KLICLB	K0.25Li0.75Cl	ClK0.25Li0.75	New
4	KLINO3ION	KLiNO3+1	KLiNO3+1	Updated
5	LI2SO4	Li2SO4	Li2O4S	Updated
6	LI2SO4.H2O	Li2SO4.H2O	H2Li2O5S	Updated
7	LICASO43.3H2O	Li2SO4.CaSO4.3H2O	CaH6Li2O11S2	Updated
8	LIHSO4	LiHSO4	HLiO4S	Updated
9	LIKNASO4	2Li2SO4.Na2SO4.K2SO4	K2Li4Na2O16S4	Updated
10	LIKSO4	LiKSO4	KLiO4S	Updated
11	LINO3	LiNO3	LiNO3	Updated
12	LINO3.3H2O	LiNO3.3H2O	H6LiNO6	Updated
13	LISO4ION	LiSO4-1	LiO4S-1	New
14	NA3LISO42.6H2O	3Na2SO4.Li2SO4.12H2O	H24Li2Na6O28S4	removed
15	NA3LISO42.H2O	3Na2SO4.Li2SO4.12H2O	H24Li2Na6O28S4	New
16	NALISO4	Na2SO4.Li2SO4	Li2Na2O8S2	Updated
17	NH4LISO4	(NH4)LiSO4	H4LiNO4S	Updated
18	LICLSO4ION	LiClSO4-2	ClLiO4S-2	removed
19	LIMGSO4ION	LiMgSO4+1	LiMgO4S+1	removed
20	LIKSO4AQ			removed, but keep solid phase

Interactions:

No	species 1	species 2	Action
1	CASO4	LIION	updated
2	COIIION	LIION	updated
3	KION	LIION	updated

4	LICL	NAION	updated
5	LIION	MNION	updated
6	LIION	NAION	updated
7	LIION	NH4ION	updated
8	LIION	NIION	updated
9	LIION	SO4ION	updated
10	LISO4ION	MGION	new
11	KION	KLINO3ION	removed
12	KLINO3ION	LIION	removed
13	KLINO3ION	NO3ION	removed
14	LICLSO4ION	LIION	removed
15	LICLSO4ION	SO4ION	removed
16	LIMGSO4ION	MGION	removed
17	LIMGSO4ION	LIION	removed
18	LIKSO4	SO4ION	removed

Butyric acid

Species:

No.	OLI Tag Name	Action
1	BUTAC2	Removed
2	BUTANION	Updated
3	BUTYRICAC	Updated
4	CABUT2	Updated
5	CABUT2.1H2O	Updated
6	KBUT	Updated

Version 11.5.1.7

General Information

One of the major updates for 11.5 is the development of Scaling induction time (how long a solid will take to form) and the inclusion of scaling inhibition chemistry (retarding the formation of solids). For this version, this feature is only available in OLI Studio.

The other major development is that all products, except for the **OLI Engine for Unisim Design** are in 64-bit (x64). This will allow for better memory management. The **Unisim Design** product is a 32-bit version, so OLI has not updated the code base to x64 until it is available from Honeywell.

The x32 bit versions of each software package are available but will not be automatically distributed. Contact OLI if you need such a version.

The databanks were released on the same date as the first product. All engine/solver updates were included on the same date as the first release.

Product	Release Date
OLI Studio/Analyzer (x64)	September 16, 2022
OLI Flowsheet: ESP / ESP FS[3] (x64)	September 16, 2022
Chemistry Wizard	September 16, 2022
OLI Developer Edition (x64)	September 16, 2022
OLI Engine 11.x for Aspen Hysys (x64 bit)	September 16, 2022
OLI Engine 11.x for Aspen Plus (x64 bit)	September 16, 2022
OLI Engine 11.x for Petro-Sim (x64 bit)	September 16, 2022
OLI Engine 11.x for ProII (x64)	September 16, 2022
OLI Engine 11.x for Unisim Design	September 16, 2022
OLI License Manager[4] (x64 bit)	September 16, 2022
OLI Engine 11.x for gProms (x64 bit)	September 16, 2022

OLI Engine 11.x for IDEAS was not updated for this release

[3] The product ESP FS is for Asia releases. It is functionally identical to OLI Flowsheet: ESP.

[4] This product does not follow the same versioning scheme as the other products. The current version is 5.0.1.5

Databank Updates

Mixed-solvent electrolyte (MSE) databank

$BaSO_4$ and $SrSO_4$ scaling prediction improvement in the presence of Ca (revision)

$BaSO_4 – CaCl_2 – H_2O$
$SrSO_4 – CaCl_2 – H_2O$
$SrSO_4 – CaCl_2 – NaCl – H_2O$
$CaCl_2 – SrCl_2 – H_2O$
$CaCl_2 – SrCl_2 – KCl – H_2O$
$Ca(OH)_2 – SrCl_2 – H_2O$

NH_3 + CO_2 + urea and related systems

$NH_3 – CO_2 – H_2O$ (revised)
$(NH_4)_2CO_3 – H_2O$ (revised)
$(NH_4)_2CO_3 – NH_3 – H_2O$ (revised)
$NH_4HCO_3 – H_2O$ (revised)
$NH_4HCO_3 – NH_3 – H_2O$ (revised)
Urea – H_2O (revised)
Urea – NH_3 – H_2O (revised)
Urea – CO_2 – H_2O (revised)
Urea – CO_2 – NH_3 – H_2O (revised)
$NH_4CO_2NH_2 – H_2O$ (revised)
$NH_4CO_2NH_2 – NH_3 – H_2O$ (revised)
$NH_4CO_2NH_2$ – Urea – H_2O (revised)
$NH_4CO_2NH_2 – NH_3$ – Urea – H_2O (revised)

Additional urea chemistry

NH_4NO_3 – Urea – H_2O

NH_3 + K_2CO_3 + MDEA and related systems

$NH_3 – K_2CO_3 – H_2O$ (revised)
$NH_3 – K_2CO_3 – (NH_4)_2CO_3 – H_2O$ (revised)
MDEA – K_2CO_3 – H_2O
MDEA – NH_3 – K_2CO_3 – H_2O
MDEA – CO_2 – K_2CO_3 – H_2O
MDEA – K_2CO_3 – CO_2 – NH_3 – H_2O
MDEA – NH_3 – H_2O
MDEA – CO_2 – NH_3 – H_2O
MDEA – NH_4HCO_3 – H_2O
MDEA – NH_3 – NH_4HCO_3 – H_2O

NH_3 + NaOH

NH_3 – NaOH – H_2O

Acids in carbon dioxide (revision)

$H_2SO_4 – CO_2$
$HNO_3 – CO_2$

Carbonyl sulfide (COS)

COS – H_2O
COS – CO_2

Acetaldehyde chemistry

Acetaldehyde – H_2O
Acetaldehyde – CO_2

Strontium chemistry

$Sr(OH)_2$ – H_2O (revised, new hydrates added)

Fe oxides, hydroxides with redox (revision)

Fe_2O_3 (hematite) – H_2SO_4, {Na,Li,K}OH
FeOOH (goethite) – {H,Na}ClO_4, NaOH, NaCl, $NaNO_3$
Fe_3O_4 (magnetite) – H_2,{H,Na}Cl,{K,Na,Li}OH, NH_3, HF, CO_2,{H,Na}Ac, H_3BO_3,{H,Na}CF_3SO_3

Fe(III) chemistry (revision)

$Fe_2(SO_4)_3$ – H_2SO_4 – H_2O
FeF_3 – HF – H_2O (density improvement)
$FeCl_3$ – HCl – H_2O (density improvement)

Nitric acid and related systems (revision)

HNO_3 – H_2O
HNO_3 – MoO_3 – H_2O
HNO_3 – WO_3 –H_2O
HNO_3 – $Pb(NO_3)_2$ –H_2O
HNO_3 – $Al(NO_3)_3$ –H_2O

Borate chemistry

Boric acid and metal borates

B_2O_3 – H_2O {H_3BO_3 – H_2O} (revised)
B_2O_3 – Li_2O – H_2O (revised)
$Li_2B_4O_7$ – H_2O
LiB_5O_8 – H_2O
$LiB(OH)_4$ – H_2O
B_2O_3 – Na_2O – H_2O (revised)
$NaBO_2$ – H_2O
$Na_2B_4O_7$ – H_2O
$NaH_4B_5O_{10}$ –H_2O
NaB_5O_8 –H_2O
B_2O_3 – CaO – H_2O (revised)
B_2O_3 – MgO – H_2O (revised)
B_2O_3 – K_2O – H_2O
KBO_2 – H_2O
KB_5O_8 – H_2O
$K_2HB_5O_9$ – H_2O
$K_2B_4O_7$ – H_2O
KBO_2 – KOH – H_2O
B_2O_3 – ZnO – H_2O

Boric acid and metal borates with chlorides

H_3BO_3 – HCl – H_2O (revised)
$LiBO_2$ – LiCl – H_2O (revised)
H_3BO_3 – LiCl – H_2O (revised)
LiB_5O_8 – LiCl – H_2O (revised)
B_2O_3 – Na_2O – NaCl – H_2O (revised)
$Na_2B_{10}O_{16}$ – NaCl – H_2O (revised)
$NaBO_2$ – NaCl – H_2O (revised)

H_3BO_3 – NaCl – H_2O (revised)
$Na_2B_4O_7$ – $CaCl_2$ – H_2O
H_3BO_3 – $CaCl_2$ – H_2O
H_3BO_3 – $CaCl_2$ – HCl – H_2O
B_2O_3 – MgO – $MgCl_2$ – H_2O
H_3BO_3 – $MgCl_2$ – H_2O
H_3BO_3 – $MgCl_2$ – HCl – H_2O
B_2O_3 – K_2O – KCl – H_2O
$K_2B_4O_7$ – KCl – H_2O
H_3BO_3 – KCl – H_2O
$Na_2B_4O_7$ – KCl – H_2O
H_3BO_3 – NaCl – KCl – H_2O

Lithium chemistry (revision)

Lithium hydroxide

LiOH – H_2O

Lithium phosphate

Li_3PO_4 – H_2O
LiH_2PO_4 – H_2O
LiH_2PO_4 – H_3PO_4 – H_2O
Li_3PO_4 – LiOH – H_2O

Na oxalate

Na oxalate – H_2O (revised)
Na oxalate – oxalic acid – H_2O (revised)
Na oxalate – Na_2CO_3 – H_2O
Na oxalate – NaOH – H_2O

Nitrile chemistry

Acetonitrile – {LiCl, Li_2SO_4, NH_4NO_3, $(NH_4)_2SO_4$, $NaNO_3$} – H_2O
Adiponitrile – H_2O
Adiponitrile – NH_3
Adiponitrile – NH_3 – H_2O
Adiponitrile – {$SrCl_2$, $BaCl_2$, LiCl, Li_2SO_4, NH_4NO_3, $(NH_4)_2SO_4$, $NaNO_3$} – H_2O
Propionitrile – H_2O
Propionitrile – {$SrCl_2$, $BaCl_2$, LiCl, Li_2SO_4, NH_4NO_3, $(NH_4)_2SO_4$, $NaNO_3$} – H_2O
methylglutaronitrile – H_2O
methylglutaronitrile – {$SrCl_2$, $BaCl_2$, LiCl, Li_2SO_4, NH_4NO_3, $(NH_4)_2SO_4$, $NaNO_3$} – H_2O

Rare earth chloride in alcohols

$NdCl_3$ – methanol – H_2O
$NdCl_3$ – ethanol – H_2O

Rare earth sulfates in alcohols

$Y_2(SO_4)_3$ – methanol – H_2O
$Y_2(SO_4)_3$ – ethanol – H_2O
$Y_2(SO_4)_3$ – 1-propanol – H_2O
$Y_2(SO_4)_3$ – 2-propanol – H_2O
$Nd_2(SO_4)_3$ – ethanol – H_2O (revised)
$Nd_2(SO_4)_3$ – 2-propanol – H_2O
$Dy_2(SO_4)_3$ – 2-propanol – H_2O

Rare earth hydroxide (revision)

$Nd(OH)_3$

Rare earth fluorides

CeF_3 (revised)
DyF_3 (revised)
EuF_3 (revised)
ErF_3 (revised)
GdF_3 (revised)
HoF_3 (revised)
LaF_3 (revised)
LuF_3 (revised)
NdF_3 (revised)
PrF_3 (revised)
SmF_3 (revised)
TbF_3 (revised)
TmF_3 (revised)
YF_3
YbF_3 (revised)

Rare earth oxalates

Nd oxalate
Yb oxalate

Rare earth carbonates

$Nd_2(CO3)_3$ (revision)
$Nd_2(CO3)_3 – H_2O$
$NdOHCO_3 – H_2O$
$NdOHCO_3 – CO_2 – H_2O$
$Dy_2(CO3)_3$
$Dy_2(CO3)_3 – H_2O$
$DyOHCO_3 – H_2O$

Scaling inhibitors

Phosphonate-based

DTPMP (Diethylenetriamine penta(methylene phosphonic acid))
acid/base and complexation with alkaline earth metals (Ba, Ca, Mg, Sr)
EDTMP (Ethylenediamine tetra(methylene phosphonic acid))
acid/base and complexation with alkaline earth metals (Ba, Ca, Mg, Sr)
PBTC (2-phosphono-butane-1,2,4-tricarboxylic acid)

Maleic acid and poly-maleic acid

MLA (Maleic acid) – acid/base and complexation with alkaline earth metals (Ba, Ca, Mg, Sr)
PMLA (Poly-maleic acid) – acid/base (revised)

Scaling inhibition kinetics

$BaSO_4$:
DTPMP
HEDP
NTMP
$CaCO_3$:
DTPMP
HEDP
NTMP
PMLA
$CaSO_4 \cdot 2H_2O$:

DTPMP
NTMP
PBTC
$SrSO_4$:
DTPMP
HEDP

Transport properties

$H_2O_2 – H_2O$	(thermal conductivity)
$LiCl – H_2O$–methanol	(electrical conductivity)
$NaHS – H_2O$	(viscosity)
$NaNO_2 – H_2O$	(viscosity)
$AlCl_3 – H_2O$	(revised, diffusivity)
$C_6H_{14} – H_2O$	(revised, interfacial tension)
$C_6H_{14} – LiCl – H_2O$	(revised, interfacial tension)
$H_3PO_4 – H_2O$	(revised, viscosity)
$LiCl – H_2O$	(revised, diffusivity, electrical conductivity)
$LiOH – H_2O$	(revised, viscosity, diffusivity, electrical conductivity)
$MgCl_2 – H_2O$	(revised, diffusivity)
$NH_4Cl – H_2O$	(revised, diffusivity)
$NiCl_2 – H_2O$	(revised, viscosity, diffusivity, electrical conductivity)

CORROSION KINETICS

Alloy 304 – revision

Corrosive environments:

NaCl
$NaCl – O_2$
O_2
$Seawater – O_2$
LiBr
$MgCl_2$
$MgCl_2 – O_2$
NH_4F
$Na_2SO_4 – O_2$
$Na_2SO_4 – NaCl$
$MgCl_2$ - NaOH
$MgCl_2$ - HCl
$CO_2 – NaCl$
$CO_2 – H_2S – NaCl$
$CO_2 – NaBr$
$NaCl – NH_3 – NH_4Cl – H_2S – CO_2$
NaOH
$NaOH – NaCl$
$NaCl – HCl – H_2$
$NaOH – HNO_3$
$NaCl – HNO_3$
Formic acid
Acetic acid
Formic acid – KCOOH
Acetic Acid- HBr
H_2SO_4
HCl
HNO_3

H_3PO_4
H_2SO_4 – NaOH
H_2SO_4 - NaCl
HCl – H_2SO_4
HCl – HNO_3
HF
H_2SO_4 – HNO_3
HCl – H_3PO_4
HF – HNO_3
HF – H_3PO_4
NaCl – HF
HBr – H_3PO_4
$CuCl_2$
$FeCl_3$
H_2SO_4 – $Fe_2(SO_4)_3$
H_2SO_4 – $Fe_2(SO_4)_3$ – NaCl
H_2SO_4 – HF – $FeSO_4$
H_2SO_4 – $FeSO_4$ – $TiOSO_4$
KF
NaF
NaF – HNO_3
NaF – NH_4VO_3
NaF – H_2SO_4
NaF – H_2SO_4 – HNO_3
NH_4NO_3 – HNO_3
NaCl – H_2SO_4 – Na_2SO_3 – HNO_3
NaF – $NaNO_3$ – HNO_3 – $Cu(NO_3)_2$
H_2SO_4 – NaCl
H_2SO_4 – Na_2SiF_6
$FeCl_3$ – HCl
NH_4HS
NH_4HS – NH_3
NH_4HS – NaCl
H_2O_2 – HCl
H_2O_2 – H_2 – O_2
H_2O_2 – H_2 – O_2 – NaCl – $FeCl_3$
Cl_2
Cl_2 – O_2

Repassivation potential parameters:

Cl^-
F^-
NO_3^-
NO_2^-
OH^-

OLI Databook – Bugs & Features & Resolved issues

Bug ID	Problem	Resolution
DT-212	Incorrect pressure dependency in density when using both Fe and F in the model	The cause of the incorrect predictions was a wrong value of the HKF a1 coefficient for FEIIIFION. This coefficient has an extremely large value in V11.0 databank, causing a density problem that was reported last year. This has been fixed V11.5.
DT-249	Custom .ddb files inside Databanks folder had invalid data in the database.	There was an invalid date in the internal databank information, the check that was there to prevent this from causing an issue did not work for this case. Updated the code to correctly handle this case.
DT-268	The Mackinawite name is in the Chemical formula. As a result, when it appears in the UI, the name is shown twice	Databases updated

Engine/Solver - Features

Bug ID	AREA	Problem	Resolution
		No new features for this version 11.5	

Engine/Solver - Bugs

Bug ID	AREA	Problem	Resolution
		No new bugs unique to all products for this version 11.5	

OLI Studio/Analyzer - Features

Bug ID	AREA	Problem	Resolution
DT-40	User Interface	Add MPag and kPag units	Completed
DT-119	User Interface	Default the thermodynamic framework to MSE	Completed
DT-215	Stream Analyzer	Added scaling inhibition	Completed, see user guide for details.
DT-280	Corrosion Analyzer	Partial pressures are missing in corrosion table report	Added the missing variable to the report. Also added were K Values, Mobilities, Self Diffusivities, Vapor Diffusivity Matrix, Gibbs, Gibbs Standard State, Entropy, Entropy Standard State, Kinetics and Redox

OLI Studio/Analyzer - Bugs

Bug ID	AREA	Problem	Resolution
DT-3	Framework	Version 11.0.1.9 cannot open a file that opened correctly in previous versions	Fixed deadlock-causing multi-threaded code that is run when loading a case file saved in certain older builds.
DT-4	User Interface	Studio: Paste (update) to stream, data is not being applied at the calculation level	When paste-updating a stream from copied data from clipboard, the stream's updated spec values were not being passed down to children objects. Fixed paste-update logic to pass stream's updated spec values down to children objects.
DT-21	User Interface	Studio: isochoric and custom calculation (total volume) does not work without H2O	The actual case was not fixed. Warnings are now added to alert the user of an infeasible case.
DT-29	Solver	Loss of mass in mixer calculation. Sublimination code enabled	This was an edge case. A warning has been added to alert the user. The warning states "WARNING: A corresponding solid (either ppt or hydrate) for the inflow XXX was not found in the chemistry model. The results may have mass balance error. Please check chemistry model."

DT-51	Solver	Compositional Survey (Contour) - calculations are missed for some points	This is an edge case. Slight differences in the input conditions can case the calculation to fail. The solver was upgraded to better handle these failed points but the situation will always remain that some points will just fail.
DT-69	User Interface	Total ion appears in an "Add as Stream" from water analysis. This field is a Water Analysis only entry	This was completed but only for new samples, Any existing sample will not be properly converted.
DT-73	Corrosion Analyzer	Running Pourbaix with H2SO4 crashes the calculation	The selected titrant was not part of the user inflow. The program now checks for this condition.
DT-81	ScaleChem	Error message about Surface Complexation database when this database is not specified	This is an issue in the add as stream using a DB identification method that is no longer correct, resulting in the message when a databank used in the model is identified as databank #16. The code needs to be updated to remove this check and use a more intelligent method by looking at the phases and identifying if there are dynamically created species in the phases, if there are only the entire stream should be allowed to be exported (Add as stream). This will cover both AQ & MSE models and private databanks that could result in this behavior.
DT-90	Corrosion Analyzer, Thermodynamics	When I add Lithium to my brine the corrosion rate goes to zero	The problem lies in the diffusivity calculations (which affect the mass transport part of corrosion rate calculations). If a small amount of lithium is added to the mixture, then the diffusion coefficients drop by about five orders of magnitude. This is obviously a bug and we will need to fix it. Without Li, the diffusion coefficients are very reasonable. OLI has fixed the diffusivity prediction. There was one incorrect diffusivity interaction parameter, which was revised. See database updates above
DT-98	User Interface	Stream copied from OLI Studio to OLI Flowsheet has a different chemistry model (solids are different)	Underlying chemistry model solid specifications are not currently copied with the stream, only redox information and databank information is included with the copy. This is fixed as Avalon and CommonModel now have the capability to choose phase and solids. OLI Studio has updated code accordingly.
DT-118	Water Analyzer	Cutting species from water analysis only removes parameter name not concentration	Cutting entire species row(s) will copy the content to the clipboard and remove row(s) from the grid. The value (concentration) column will be correctly matched.
DT-138	Corrosion Analyzer	Corrosion rate warning for missing components does not include CN species	Corrosion rate valid information was updated to show the warning for CN.
DT-241	Corrosion Analyzer	A private units set was created for this case. it consists of English units. These units are honored in the grid, but in the Summary section, the units are returned in metric	Units are now consistent with grid. Also changed from speed to velocity as shown in the grid.
DT-249	Model Generation	Custom .ddb files inside Databanks folder had invalid data in the database.	There was an invalid date in the internal databank information, the check that was there to prevent this from causing an issue did not work for this case. Updated the code to correctly handle this case.
DT-261	Reporting	Reported phase flows in summary and report seems to be doubled. OK in trace file. TDS enabled	This is fixed by temporarily disabled TDS before entering the converge loop. Turn it back on after the loop so EQTDS only get called once.
DT-279	Corrosion Analyzer	When one calculates a corrosion survey, it is often necessary to compare polarization curves for two or more points of the survey. The first polarization curve in a survey is shown by default and it looks good. However, when a polarization curve for another point is added to the plot, the added polarization curve has symbols superimposed on top of the lines. Symbols on top of a polarization curve do not make any sense - only lines should be rendered by default. We need to fix it by eliminating symbols from polarization curves.	Polarization curves ignored the user styles and only use the styles of the first survey point. It wasfixed o honor user selected styles. Now the problem is that when user added a second survey point the styles are very different from the first point, thus make it hard to do the comparison. Polarization curves are rendered incorrectly in corrosion rate survey can be considered fixed. We will work for a better way to satisfy both issue in the future.

		This bug appeared in v11. V10 and older versions were fine.	
DT-302	Stream Analyzer	Copying the flowsheet stream to studio brings the databases in the wrong order	This is fixed and the order should be the same between the source (flowsheet) and the target (studio).

OLI Flowsheet: ESP / ESP-FS - Features

Bug ID	AREA	Problem	Resolution
DT-40	User Interface	Add MPag and kPag units	Completed
DT-119	User Interface	Default the thermodynamic framework to MSE	Completed
DT-219	User Interface	Set default condition for feedback controllers to be “Continue” instead of “Stop” if the controller fails to converge	Completed
DT-373	User Interface	Hyperlinked error messages did not wrap properly in some layouts	Improved hyperlinked messages regardless of layout.
DT-405	User Interface	RO property window did not scale appropriately so some text was hard to read.	Scaling improved to be readable at all resolutions.

OLI Flowsheet: ESP / ESP-FS - Bug

Bug ID	AREA	Problem	Resolution
DT-13	Optimizer	FESP: Cannot see value in optimizer cell, column needs to be wider	Objective function UI was modified so that the subexpression grid expands to entire available width thereby maximizing width of property value field
DT-22	Framework	Immediate program crash when running case	Case was failing in an an expected manner because the settler block was inadvertently configured with an inconsistent units set which caused a failure when creating the .bin file for passing to the solver. Modified units handling code to prevent streams or blocks to be assigned a units set where inflows are in conc-by-vol basis (mg/L etc.) The modified logic also handles old cases where some blocks were already assigned the bad unit sets.
DT-48	Optimizer	Cannot update tray efficiency using Update function in Optimizer	Fixed bug in logic that handles the setting/updating of specs of Tower/Column.
DT-53	User Interface	Tear stream configured as a FF controller target produces the incorrect warning "The tear stream XX is also configured as the target of a controller - this may make convergence difficult."	Modified code to not issue a warning when a tear stream is setup as the control input to a feed-forward controller.
DT-61	User Interface	Text box annotation font size not being honored	Fixed logic issue in synchronization of font size and height of text annotations with underlying graphics toolkit.
DT-75	Solver	Scaling tendencies not reported for pump	This is an engine bug, which happens in the pump unit regardless of its setup. Scaling tendencies are indeed computed for pump, but are not properly saved, and that's why scaling tendencies are not shown in the UI
DT-78	Solver	Case freezes after converging, then next attempt crashes in the middle of the run	This is an engine issue. Engine is not handling surface complexation accurately for column. The workaround is creating a submodel without surface species for column only.
DT-94	Solver	RO Block reduces membrane area, but only 50% of the feed exits the permeate and the Concentrate osmotic pressure is low.	Producing more permeate now, but at high recovery, this has to stop and then reduce membrane area. At high recovery, a little change in composition may cause an exponential increase in osmotic pressure which may result in non-convergence. This has been only partially fixed
DT-98	User Interface	Stream copied from OLI Studio to OLI Flowsheet has a different chemistry model (solids are different)	Underlying chemistry model solid specifications are not currently copied with the stream, only redox information and databank information is included with the copy. This is fixed as Avalon and CommonModel now have the capability to choose phase and solids. OLI Studio has updated code accordingly.
DT-102	User Interface	Cannot attach or delete a stream	Unresponsive streams were caused by an internal "orphan" condition. Code has been revised to remove orphaned streams when a file is loaded - they should no longer appear in the application.

DT-105	User Interface	No error message when controller does not converge using Half-Interval Method, "Simulation Complete" comes up	Half-interval controller unconverged/continue options was corrected.
DT-106	User Interface	Top toolbar is lost and no clear way to bring it back	Added logic to reinstate the menu bar in the app window if it was accidentally detached or was not visible at all. Also added logic to prevent the menu bar from being detached from the main app window which prevents the problem from happening in the first place.
DT-108	Optimizer	Optimizer tool failed with the error - A call to OLI Process API failed unexpectedly	The error message was displayed due to improperly formatted variable names. The fix involved revising the variable name validation mechanism to correctly report both load-time as well as interactive errors. Note that the variable name formatting rules have changed to the following: • contain only letters, numbers or underscores • not begin with a number • not contain spaces • not be empty
DT-109	Optimizer	When checking one optimizer variable box another is changed	Fixed bug in the code related to selection/unselection of variables in optimizer variables spec UI. Also improved UI refresh code to address UI responsiveness.
DT-116	Optimizer	When trying to use Optimizer, get error "OLI Process API exited in an unexpected manner"	A processAPI issue accessing and storing data has been corrected. An engine check to protect pressure drop calculation when there are errors in volume calculation has been added.
DT-122	Solver	Restart did not work (did not function, program converged) when disabling a controller after the program had run. This is limited to feedforward controllers	Logic improved to detect a change in state and only calculate what has changed.
DT-128	User Interface	Popup error appears when updating the controllers when using a REACTOR block	Fixed Reactor block data access functions that were causing the error popups to appear.
DT-182	Framework	Solver exiting error in flowsheet case when first updating controller parameters. OK on second update.	This bug is confirmed when Flowsheet Start/Stop/Restart optimization is turned on, and is probably caused due to FESP: Restart optimizations cause incorrect disconnected stream warnings when feed-forward controllers are present.
DT-235	User Interface	The contact support button crashed out the software when the “Copy to Clipboard” option was selected.	This was fixed.
DT-249	Model Generation	Custom .ddb files inside Databanks folder had invalid data in the database.	There was an invalid date in the internal databank information, the check that was there to prevent this from causing an issue did not work for this case. Updated the code to correctly handle this case.
DT-281	Solver	Mixer outlet temperature much lower than inlet streams temperature, affects Wash Water Rate Calculations	Updated the solver code. This is a work-in-progress and may be revised for future versions
DT-380	User Interface	Process comments were not saving beyond three lines of comments.	Increased field to accept 25 lines.
DT-404	Solver	RO bock with an optimizer crashed due to memory errors when run multiple times.	Memory usage updated.
DT-405	User Interface	RO property window did not scale appropriately so some text was hard to read.	Scaling improved to be readable at all resolutions.
DT-422	User Interface	The solver failed in the optimizer code when the initial value was outside the entered minimum and maximum values.	The interface now checks and error traps this condition.
DT-454	Solver	RO Number of Vessels Round Figure in the Optimizer does not work	This is fixed in ProcessAPI due to inconsistent dummy output for the requested block outputs. There was also some flowsheet work to align with the ProcessAPI changes.
DT-455	User Interface	The word “Co-efficients” is misspelled in the mass-transfer dialogs	The correct word of coefficients is now used.
DT-469	User Interface	Case Libraries cases should be run and saved in V11.5	Creating a case from a template file or from case library now resets the "created in" and "last saved in" versions (creation time and unique document ID is also reset). Also,

			any results saved in the template case are not loaded into the new case.
DT-474	Solver	Mixer survey in OLI Studio is not giving the same results as in OLI Flowsheet Sensitivity calculation	Conditions updated when to use initial estimates
DT-476	Solver	Two flowsheet cases are compared. One at the bubble point temp (OK), when below bubble point temp (no liquid reported)	Conditions updated when to use initial estimates

Alliance Products - Features

Bug ID	Program	Problem	Resolution
DT-99, DT-150	Aspen Plus, Hysys, Unisim Design, ProII	Update the configuration tools for each product to accept the host programs latest version	Complete

Alliance Products - Bugs

Bug ID	Program	Problem	Resolution
DT-334	Petro-SIM	Opening Stream Analyzer file with imported DBS created by PetroSIM crashes Stream Analyzer	When opening an existing case the logic to write out the dbs from the read in file, also looks to write a mod file, however there was no mod file stored so it caused a crash. Updated logic to prevent the crash.

OLI Chemistry Wizard (all products)

Bug ID	Program	Problem	Resolution
DT-119	User Interface	Default the thermodynamic framework to MSE	Completed
DT-369	Model Generation	Carbon Monoxide substituted by Cobalt in component selection	This issue was resolved with a bug reported in ChemistryAPI. Tested in PetroSIm with 11.5.1.4 and adding CO correctly adds Carbon Monoxide.

OLI Developer Edition - General

Bug ID	Program	Problem	Resolution
DT-12	Solver	Upgrade to x64	Completed

OLI Framework - General

Bug ID	Program	Problem	Resolution
		No new features for this version 11.5	

Version 11.0.1.9

General Information

Version 11 introduces the concept of vertical markets. This means we have segmented our databases to reflect these vertical markets. Some species, previously available to all licensees, are now segregated into individual verticals. These "Segments" are now licensed separately.

For existing licenses that exist for the release of version 11, no segments are implemented. Users with existing licenses can use all these species.

The databanks were released on the same date as the first product. All engine/solver updates were included on the same date as the first release.

Product	Release Date
OLI Studio/Analyzer	June 11, 2021
OLI Flowsheet: ESP / ESP FS[5]	June 11, 2021
Chemistry Wizard	June 11, 2021
OLI Developer Edition	June 11, 2021
OLI Engine 11.x for Aspen Hysys (x64 bit)	June 11, 2021
OLI Engine 11.x for Aspen Plus (x64 bit)	June 11, 2021
OLI Engine 11.x for Petro-Sim (x32, x64 bit)	June 11, 2021[6]
OLI Engine 11.x for ProII	June 11, 2021
OLI Engine 11.x for Unisim Design	June 11, 2021
OLI License Manager[7] **(x32, x64 bit)**	June 11, 2021
OLI Engine 11.x for gProms (x64 bit)	June 11, 2021

OLI Engine 11.x for IDEAS was not updated for this release

[5] The product ESP FS is for Asia releases. It is functionally identical to OLI Flowsheet: ESP.

[6] Version 11.0.1.x of the OLI Engine will only work with version 7.2 of Petro-Sim.

[7] This product does not follow the same versioning scheme as the other products. The current version is 5.0.1.5

Databank Updates

Mixed-solvent electrolyte (MSE) databank

Special Note about the HF-Alkylation Database

In the V11 MSE databank (MSEPUB), OLI has incorporated all contents in ALKHF into MSEPUB. In this process, changes were made to the names of ASOs (Acid Soluble Oils), i.e., from ASO0, ASO1,....to ACIDSO0, ACIDSO1, etc. These changes are necessary due to conflicts of species names with variable names for activity coefficients (e.g. ASO2AQ and ASO3AQ for activity coefficients of SO2AQ and SO3AQ) - which caused problems in the comprehensive tests of V11 MSE databank by the Software Team. Because of these changes and updates to MSEPUB databank, OLI would like to make clarification as follows:

1. The ALKHF databank is no longer needed (**and should not be included - see 3 below**) in V11 for the HF alkylation modelling - due to the full incorporation of ALKHF into MSEPUB;

2. The ASO's can still be input as ASO0, ASO1,etc., as the MSEPUB keeps them as synonyms; but the chemistry model generated will be using the actual species names (e.g. ACIDSO0, ACIDSO1,...etc) in the related model files (such as dbs);

3. If ALKHF databank is included in V11, there will be conflicts of having the same ASOs with two different names (e.g., ASO0 (from ALKHF) and ACIDSO0 (from MSEPUB)) and different equilibrium equations (with different names), which causes issues as reported by Prodip.

4. ALKHF databank can (and should) still be used with V10 Studio and Flowsheet for HF alkylation modelling. The differences between V10 and V11 are in the use of different ASOs' names (i.e. ASO0 vs. ACIDSO0, which will not affect the results).

Acetic acid – acetate – hydrocarbon systems (revision)

Acetic acid – H_2O
Acetic acid – HCl
Na acetate – acetic acid
Li acetate – acetic acid
K acetate – acetic acid
Ca acetate – acetic acid
Acetic acid – CO_2
Acetic acid – acrylic acid
Acetic acid – methylisobutylketone (MIBK) – trioctylamine
Acetic acid – toluene – trioctylamine
Acetic acid – methanol
Acetic acid – ethanol

Acetic acid – hydrocarbons (methane, cyclohexane, benzene, ethylbenzene, o-xylene, p-xylene, m-xylene, isopropylbenzene)

Acids in carbon dioxide

H_2SO_4 – CO_2
HNO_3 – CO_2

Monoethylene glycol (MEG) systems (revision)

MEG – CO_2
MEG – $CaSO_4$

NaCl scaling chemistry (revision)

NaCl – H_2O pressure dependence

FeS scaling chemistry (revision)

FeS (mackinawite, pyrrhotite) – NaCl, HCl, NaHS,

Amine hydrochloride chemistry

Diethylenetriamine HCl
Monomethylethanolamine HCl
Dimethylethanolamine (DMEA) HCl (revision)
Morpholine HCl (revision)
3-methoxypropylamine HCl (revision)
Methyldiethanolamine (MDEA) HCl (revision)
N-Methylmorpholine HCl (revision)
Butylamine HCl (revision)
Dimethylisopropanolamine HCl (revision)
Isopropanolamine HCl (revision)
Methylamine HCl (revision)
Dimethylamine HCl (revision)
Trimethylamine HCl (revision)
Ethylamine HCl (revision)
Diethylamine HCl (revision)
Propylamine HCl (revision)
Sec-Butylamine HCl (revision)
Cyclohexylamine HCl (revision)
Ethylenediamine HCl (revision)
N-ethylmorpholine HCl (revision)
Ethanolamine HCl (revision)
Diethanolamine HCl (revision)
Diglycolamine HCl (revision)

Hydrogen fluoride - hydrocarbon chemistry

Hydrocarbon – HF – H_2O systems
- Propene (C_3H_6)
- Propane (C_3H_8)
- Butene (C_4H_8)
- Isobutene (i-C_4H_8)
- Cis-2-butene (cis-2-C_4H_8)
- Trans-2-butene (trans-2-C_4H_8)
- Butane (C_4H_{10})
- Isobutane (i-C_4H_{10})
- Pentane (C_5H_{12})
- Isopentane (i-C_5H_{12})
- Neopentane (neo-C_5H_{12})

Cis-2-hexene (cis-2-C_6H_{12})
Hexane (C_6H_{14})
2-Methylpentane (C_6H_{14})
Cyclohexane (C_6H_{12})
Methylcyclopentane (C_6H_{12})
Heptane (C_7H_{16})
2,3-dimethylpentane (C_7H_{16})
Methylcyclohexane (C_7H_{14})
Octane (C_8H_{18})
2,4-dimethylhexane (C_8H_{18})
Isooctane (C_8H_{18})
Nonane (C_9H_{20})
2,2,5-trimethylhexane (C_9H_{20})
Decane ($C_{10}H_{22}$)
Undecane ($C_{11}H_{24}$)
Dodecane ($C_{12}H_{26}$)

Mixed hydrocarbon – HF – H_2O systems
Isobutane – n-octane
Isobutane – isooctane
Isobutane – alkylate
n-butane – isooctane
n-butane - alkylate

Acid soluble oils: ASO0, ASO1, ASO2, ASO3, ASO4, ASO5
Acid soluble oils – H_2O
Acid soluble oils - HF

Additional hydrocarbon chemistry

2-methylpentane – H_2O
2,3-dimethylpentane – H_2O
2,4-dimethylhexane – H_2O
2,2,5-trimethylhexane – H_2O

Mercury chemistry

Hg_2Cl_2
Hg_2Cl_2 – HCl, NaCl, KCl
$HgCl_2$ (revision)
$HgCl_2$ – HCl
Hg_2F_2
HgF_2
HgF_2 – HF – HgO – HgOHF

Cadmium chemistry

$Cd(OH)_2$ as a function of pH
CdO as a function of pH
CdF_2
CdF_2 – NH_4F

Osmotic pressure prediction

Improved algorithm for calculating the partial molar volume of water for predicting osmotic pressure

Phosphonate scaling inhibitors

HEDP (1-hydroxyethylidene-1,1-diphosphonic acid or etidronic acid)
HEDP complexes with Ca, Sr, Ba
NTMP/ATMP (Nitrolo tri (methylene phosphonic) acid)

NTMP/ATMP complexes with Ca, Sr, Ba

Zinc chemistry

$Zn(OH)_2$, ZnO as a function of pH (revision)

ZnO – NaOH

ZnO - NaCl

Lithium phosphate chemistry

Li_3PO_4, LiH_2PO_4

$Li_2O – P_2O_5 – H_2O$

Cobalt chemistry

$CoHPO_4$

$Co_3(PO_4)_2$, $Co_3(PO_4)_2 \cdot 8H_2O$

$LiCoO_2$

Mixed sulfates of Li and transition metals

$NiSO_4 – CoSO_4$

$NiSO_4 – MnSO_4$

$Li_2SO_4 – MnSO_4$

Gluconates of transition and alkaline earth metals

Co gluconate

Fe(II) gluconate

Fe(III) gluconate

Mn gluconate

Mg gluconate

Ca gluconateRare

Rare earth hydroxides

$La(OH)_3$

$Ce(OH)_3$

$Pr(OH)_3$

$Nd(OH)_3$

$Sm(OH)_3$

$Eu(OH)_3$

$Gd(OH)_3$

$Tb(OH)_3$

$Dy(OH)_3$

$Ho(OH)_3$

$Er(OH)_3$

$Tm(OH)_3$

$Yb(OH)_3$

$Lu(OH)_3$

$Y(OH)_3$

Rare earth acetates

La acetate

Ce acetate

Nd acetate

Rare earth phosphates

$GdPO_4$, $GdPO_4 \cdot 0.667H_2O$, $GdPO_4 \cdot 2H_2O$

$NdPO_4$

$NdPO_4$ – H_2SO_4 – H_3PO_4
$NdPO_4$ – $CaSO_4$ – H_3PO_4

Rare earth citrates

Nd citrate as a function of pH
Nd citrate – citric acid - NaOH

Rare earth tartrates

La tartrate as a function of pH
La tartrate – tartaric acid
Nd tartrate as a function of pH

Rare earth sulfates in alcohols

$Nd_2(SO_4)_3$ – ethanol – H_2O
$Dy_2(SO_4)_3$ – ethanol – H_2O

Calcium sulfate chemistry

$CaSO_4$ – H_3PO_4

Fluoride chemistry

MgF_2 (revision)
MgF_2 – NaF including $NaMgF_3$

Alpha-methylstyrene chemistry

Alpha-methylstyrene – H_2O
Alpha-methylstyrene – acetone – H_2O
Alpha-methylstyrene – phenol – H_2O
Alpha-methylstyrene – H_2SO_4 – H_2O

TRIS chemistry

TRIS (Tris(hydroxymethyl)aminomethane) – H_2O
TRIS (Tris(hydroxymethyl)aminomethane) hydrochloride – H_2O

Additional urea chemistry

Urea - ethanol – H_2O

Sodium salts revisions

$Na_3PO_4 \cdot 12H_2O$ – additional solid phase
$NaOH \cdot Na_2SO_4 \cdot NaCl$ triple solid phase

Mixed acids

H_3PO_4 – H_2SO_4

MSE-SRK databank

Density improvements

CO_2 – H_2O

Elemental sulfur

S – H_2O

Acetic acid – acetate – hydrocarbon systems (revision)

Acetic acid – H_2O – hydrocarbons (hexane, cyclohexane, benzene)

Aqueous corrosion kinetics databank

Alloy 13%Cr – revision

Corrosive environments:

NaCl
Seawater – O_2
H_2S – NaCl
CO_2 – NaCl
CO_2 – H_2S – NaCl
KOH
NaOH – $NaClO_3$
Acetic acid
CO_2 – H_2S – NaCl – acetic acid
H_2SO_4
HCl
HNO_3
H_3PO_4
HF – HCl
$FeCl_3$ – $FeCl_2$ – NaCl – HCl
$CuCl_2$ – CuCl – NaCl – HCl
$CuSO_4$ – H_2SO_4
KCl
Completion fluid – CO_2
CaCl2 – CO_2
Butyric acid
K_2CO_3
HCl – citric acid – methanol
Sour gas well simulation

Repassivation potential parameters:

Cl^-
H_2S
$SO4^{2-}$
NO_3^-
OH^-
$VO4^{3-}$
MoO_4^{2-}

Alloy 254SMO – revision

Corrosive environments:

NaCl
Seawater – O_2
Cl_2
Acetic acid
H_2SO_4
HCl
HClO
H_3PO_4 – NaCl

$FeCl_3$ – $FeCl_2$ – NaCl – HCl
$CuCl_2$ – CuCl – NaCl – HCl
H_2SO_4 – HCl – $FeCl_3$ – $CuCl_2$

Repassivation potential parameters:

Cl^-
H_2S
$SO4^{2-}$
NO_3^-
OH^-
$VO4^{3-}$
MoO_4^{2-}
S_2O_3

Alloy 316 – revision

Corrosive environments:

NaCl
Seawater – O_2
$MgCl_2$ – NaCl
NaCl – O_2
NH_4F
$AlCl_3$
Na_2SO_4
Na_2SO_4 – O_2
$MgCl_2$ – NaCl – $CaCl_2$
$NaHCO_3$ – NaCl
Na_2SO_4 – NaCl – NaAc – O_2
$CaCl_2$
$BaCl_2$ – O_2
KCl – O_2
NaBr
Cl_2
H_2S – NaCl
CO_2 – NaCl
CO_2 – H_2S – NaCl
NaCl – acetic acid – H_2S – CO_2
NaOH
NaOH – NaCl
Formic acid
Acetic acid
Formic acid - acetic acid
Boric acid
H_2SO_4
HCl
HNO_3
H_3PO_4
HCl – H_2SO_4
HCl – HNO_3
HF
H_2SO_4 – HNO_3
HCl – H_3PO_4
HNO_3 – H_3PO_4
H_2SO_4 – HF
HF – HNO_3
HF – H_3PO_4

$HCl – HF$
$HBr – H_3PO_4$
HBr – acetic acid
$H_2SiF_6 – H_3PO_4 – H_2SO_4$
$HF – H_3PO_4 – H_2SO_4$
$HCl – H_3PO_4 – H_2SO_4 – H_2SiF_6 – HF$
$HF – HNO_3 – H_2SO_4 – HCl$
$CuCl_2$
$FeCl_3$
$FeCl_3 – FeCl_2 – NaCl – HCl$
$CuCl_2 – CuCl – NaCl – HCl$
$H_2SO_4 – Fe_2(SO_4)_3$
$H_2SO_4 – Fe_2(SO_4)_3 – NaCl$
$H_2SO_4 – FeSO_4$
$H_2SO_4 – CuSO_4$
$NaF – H_3PO_4$
$NaF – H_3PO_4 – H_2SO_4$
$H_2SO_4 – NaCl$
$H_2SO_4 – Na_2SiF_6$
$H_2SO_4 – CuCl_2$
$FeCl_3 – HCl$
HCl – KI
$CaSO_4 – H_3PO_4 – NaCl – NaF$
$HF – NaCl – O_2$
$HNO_3 – NaNO_3 – Cu(NO_3)_2 – NaF$
$NaCl – H_3PO_4 – O_2$
$HNO_3 – NaCl$
$Na_2SO_4 – NaCl – FeCl_3 – Na_3PO_4 – O_2$
$NaCl – Na_2CO_3 – NaOH$
$NaCl – CaCl_2 – CaSO_4 – O_2$
$KCl – NaCl – O_2$
$NaNO_3$
$CaCl_2 – KCl – KOH – K_2SO_4 – K_2CO_3$
$NaClO_3 – NaOH$
$H_2SO_4 – NaOH – SO_2$
$NaOH – NH_4OH – KOH$
NaOCl – NaCl – NaOH
NH_4HS
$NH_4HS – NH_3$
$NaCl– KCl– CaCl_2–NaHCO_3–Na_2HPO_4.2H_2O–KH_2PO_4–MgSO_4.7H_2O–MgCl_2.6H2O–Glucose$

Repassivation potential parameters:

- Cl^-
- Br^-
- H_2S
- SO_4^{2-}
- NO_3^-
- OH^-
- VO_4^{3-}
- MoO_4^{2-}
- $C_2H_3O_2^{-1}$ (acetate ion)

NO_2^-
S_2O_3

Carbon steel – revision

Corrosive environments:

I^{-1}

OLI Databook – Bugs & Features

Bug ID	Problem	Resolution
2748	When exporting a databank from the OLI Databook the fields int the A01 file do not line up with the data correctly ex: ORG shows Databank Name, ASID show ORG etc	Code was using column numbers with select * (all fields) so column index should be looked up by field name and not assumed. Updated code for A01 file to use a lookup. We should plan to update the balance of the A file exports to fix this. Also updated output of doubles to use a Fortran routine to match the output from ESP 9.6 datebook. The only issue we are seeing now is ESP runs some fields through a double to float conversion which slightly changes the numbers. Talking with Arjun we should not do this to allow numbers to be more precise
3355	OLI Databook Make it easy to find the OLI Databook's	The system databases are now pinned so they are easy to find.
3356	A user requested that the search criteria be saved so that she can view the available list without all the duplications. Her preference is MATC. However, others may want formulas or synonyms. Therefore, save is the preferred improvement vs. fixed criteria that the person needs to change regularly	Updated code to support the options being saved (in the registry). Also updated initial startup code to stack the databanks and search windows for ease of use. Also update the search of species/interactions/mat codes to show the number of entries found.
3476	Chemical formula for GdO(OH) is misspelled as DdO(OH)	Resolved by TPM team.
3612	OLI Databook: Validate empirical formulas result in correct molecular weight on import	Updated code for saveGeneral to compute the molecular weight of the empirical formula and then compares it to the supplied molecular weight if they are not within a small tolerance the formula is wrong. If there is an error a message box will be displayed in databook, while converting an entire databank a warning file will be written into the same folder as the final databank.
3632	Databook: EXT-DENM is expected as DMD11-DMD15, currently this is BMD11-BMD15	Variables aligned properly
3730	The A04 file is exported in order entered not sequential order new synonyms are at the end rather then grouped with others synonyms for the same tag	Update the export code for A04 file to properly sort the exported data in tag/level order.
3810	When importing ASCII files if the version number in the A01 file is incorrectly formatted (ex: 10.) the converter would crash	Code placed to trap out this situation.
3821	When importing ASCII files if the version number in the A01 file is incorrectly formatted (ex: 10.) the converter would crash	Updated selected import code to use new import routines to solve the issue and ensure they are consistent.
3841	Update issues with Databook export of AFiles 1) Not V- on version number in A01 file 2) Date should be 00-mon-yy not 00-mon-yyyy 3) Aqueous record R_UQ/Q_UQ/RADI was output with trailing. for integer values 4) Dependent ref TRAN & QUAL fields do not match original	Updated SQLiteDataProvider and Databook to handle #1 correctly Update SQLiteDataProvider to fix 2,3,4

Engine/Solver - Features

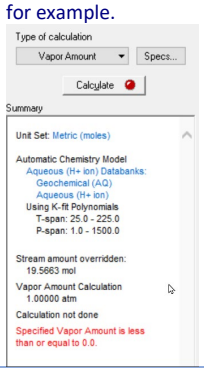
Bug ID	AREA	Problem	Resolution
3534	Thermo	MSESRK Density Improvements - finalize + testing	finalized engine changes + conducted additional testing of cases. Continuation of OS-3447

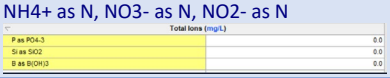
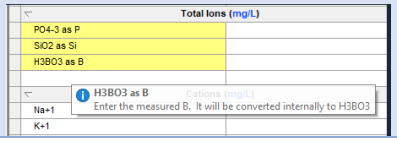
Engine/Solver - Bugs

Bug ID	AREA	Problem	Resolution
3401	Thermo	Partial molar volume improvement for osmotic pressure calculations additional testing and cleanup	Tested, cleaned up and committed partial molar volume improvement for osmotic pressure calculations.

3640	Solver	OLI Engine is incorrectly predicting VLE/LLE for H2SO4/CO2	V9.6.2 predicts VLE until ~64 atm and suddenly change to LLE. V9.6.3 and after start predicting VLLE below 64 atm but the predictions are not continuous. A known issue of the Engine is it tends to remove phases when it has difficulties to converge. Several bugs related to Engine failing to predict L2 phase have been worked on for V9.6.3. Several "helpers" have been added to the solver to find the L2 phase before remove the phase equations. This helps the Engine to find the L2 phase at lower pressures for this case but still failed at some points. A few additional fixes are added to assist Engine to smoothly predict the L2 phase appearance. However, the L2 appearance at pressures lower than 64 atm is not physically reasonable according to Andre and Ron. But those are mathematically correct solutions so the Engine cannot avoid finding them. Ron found a workaround to start with an initial inflow ratio that avoids the LLE envelope.
3886	Corrosion Solver	Update Rates valid information in Databank	Updated SQL file CorrosionRatesInfo.txt to included latest flags
4006	Solver	Crash in studio running MSE	Additional checks for pointer were added.
4061	Solver	Units for "Hardness" as "CaCO3 mg/L" were in error	Corrected the units per USGS documents.
4147	Solver	A case files fails with a solver error. If the flow units are in g/hr, then the calculation works fine. if instead it is changed to volume, then the calculation fails with the error shown. The problem disappears if a very small amount of H2O is added	A case files fails with a solver error. If the flow units are in g/hr, then the calculation works fine. if instead it is changed to volume, then the calculation fails with the error shown. The problem disappears if a very small Added check to prevent a crash. The case will now catch the error. The volume target may still fail as this type of gas only calculation does not go through the solver without water, hence, volume target can not be achieved. A controller may be used alternatively. amount of H2O is added

OLI Studio/Analyzer - Features

Bug ID	AREA	Problem	Resolution
155	Plotting	Need to reorder variable columns in the View Data for exporting	Reorder implemented.
645	Plotting	Units do not change on plot after changing the via Units Manager	Plot is now updated after units changed.
919	Units Manager	There is a need for mmol/L in units	Added
DT-137	Stream Analyzer	In the attached Studio file, I ran a vapor amount calc in the first single point calc. The error message states that "Specified Vapor Amount is less than or equal to zero". A vapor amount can't be less than zero. Error message should be changed to ""Specified Vapor Amount is zero" for example. 	The Vapor amount Calculation shows Moles (True) - Vapor (mol) for the target in the grid if should reflect the calc type like vapor fraction does (see images below) also the message should be changed to specify target Vapor amount must be greater than or equal to 0 (consistent with vapor fraction). So we will enable 0 for Vapor Amount which would be consistent with Vapor Fraction.

DT-238	Water Analysis	Current text under "total ions" is included as a picture. This is confusing to the user because analytical data is report as the ion (for example - orthophosphate as P). Recommend switching the text to say "PO4-3 as P", "SiO2 as Si" and B(OH)3 as B. Also recommend adding NH4+ as N, NO3- as N, NO2- as N 	Modification has been made for Total P, Total Si, and Total B. A pop-up tooltip will give more description. 
DT-468	Stream Analyzer	MSE is now the default thermodynamic framework. The standard objects should be updated to support MSE	Standard library objects updated for MSE
DT-498	ScaleChem	Brine Analysis to show Alkalinity end point pH all time	This is fixed and it is now consistent with WaterAnalysis.

OLI Studio/Analyzer - Bugs

Bug ID	AREA	Problem	Resolution
---	Copy and paste	Copy as stream from OLI Flowsheet to OLI Studio that has no flow for H2O, the paste may have invalid values for water (typically a value related to 55.5082 gmoles)	No resolution for V11, a known issue to be fixed in a later version.
392	Stream Analyzer	Autoclave Calculation does not report some thermodynamic values	In the autoclave calculation, the array "iprop" controlling the output of thermo properties is first defined and allocated correctly in the subroutine "eqautoclave". However, when it was passed to a subroutine "user_model5", it was deallocated and re-allocated with different size and then initialize with different values. This affects the properties being reported. Both deallocation and subsequent allocation of "iprop" are unnecessary in "user_model5", and thus being removed.
DT-414	Corrosion Analyzer	A client created an alloy and when calculating a stability diagram the software produced an odd error and crashed. He was using V10.	This was an error in the order of databanks. The PUBLIC/MSEPUB database was called first instead of last which ignored the alloy which is treated as a database entry. This was corrected by calling the databases in the correct order.
DT-458	ScaleChem	Indecipherable characters in facilities report	Characters corrected.
DT-460	ScaleChem	A brine analysis is used to define a 100% methanol stream, then stream is then used in a mixer and is defined as 50% water/50% methanol; it should be 100% methanol	When the reconcile is run we forcibly add 55.508 moles of water if the water content is less than 0.1 moles. The code was updated to only add water if the entry basis is in concentration units.
DT-484	Stream Analyzer	Object library does not appear when the option is selected. Only after close/reopen	There was identified by the development team earlier and resolved in OS-2031, however the fix only applied to the main menu and not the context menu. Updated the context menu to use the same code path as the main menu to resolve the issue.
DT-493	Stream Analyzer	The chemistry category does not appear in the Tools>Options window. This is how a user defines the framework and databases when they start the software.	The code path for adding the options to the options screen was updated and the Chemistry option was not updated resulting in the chemistry screens not being added. This has been corrected and the screens are now added correctly.
DT-494	Stream Analyzer	An OLI Application Engineer observed this issue. Set the stream units to Conc. Next change the stream amount to something other than 1 L. Add an inflow, NaCl and add 50,000 mg/l (not important). Add a single point isothermal and calculate. The software changes the stream amount to 1 L, even if the user needs to have a different volume. the images show before and after calculation. you can see that the 1L has a thick bar indicating that it changed from the original value	The following line of code seems to be the issue Line 271 in ScratchPadCalc.cpp (in calculateConvergeVolume) m_pWorkStream->applyUserInteractionSpec(UserInteractionSpec(SolverUnitSet::GetInstance()));//OS-398: change to mole. This line is needed anymore and may be a missed removal from the changes in OS-398: When this line is skipped the results seem to be correct.
DT-495	ScaleChem	Reconciled brine created two sub-objects. One had no data	A stray lock object was created and not properly deleted.

564	Stream Analyzer	Copying a mixer removed the inlet stream results in the source mixer	When a regular survey is copied all survey points got temporarily removed, and then restored after copy. In mixer there may be flash calcObjects which are not survey points. When these flashes are temporarily removed their reference count drop to 0 and self destructed. To avoid that we temporarily add these flashes to the survey point array, and later remove them from the array. Thus the flashes will not get destructed after survey point array restored. The other issue is when these flashes were temporarily removed the m_keyScratchPadCalc were set to -1, so we have to set them back the the valid key values during the restore.
647	Corrosion Analyzer	Settings for a polarization curve are not saved after a file save.	The bug is due to always use the first line's color for all the lines in a given sub group. However, once user has changed individual colors in the sub group we should honor user selection.
746	Stream Analyzer	Copying data from an external source into a brine analysis did not work if the source data had commas (instead of decimals) in the data.	Updated number parser to support comma's looking for correct number of digits between commas and proper placement of comma's in the number. Incorrect placement and the number will not be parsed.
1673	Stream Analyzer	Calculation with REDOX enabled used the "Save As Stream" function but used the original inflows and not the inflows based on the reduced or oxidized species.	New inflows are used in the "Save As Stream" function based on the calculated redox results and not the original inflows.
1744	Corrosion Analyzer	Pourbaix Diagram has incorrect contact surface when is copied and pasted	Updated code to properly copy contact surfaces when they are a component in the databanks. Copying a diagram that uses an allow still does not work, this is a larger issue and a new story will need to be opened to address this.
2244	Solver	Incorrectly calculated phase behavior (100 % all vapor when 2 phases are expected) in a survey	Vapor-organic initializer for the solver was updated.
2256	ScaleChem	A saturation calculation incorrectly calculated the neutral H2S concentration.	The internal tables used to fill in the value in the report used an incorrect molecular weight.
2261	Framework	A stream copied from OLI Flowsheet in "Day" units had its flowrate multiplied by 24 in OLI Studio, also in Day Units	Conversion error fixed.
2271	Solver	Modified critical parameters of pseudocomponents in MSE-SRK for better match. EOS solver cannot solve properly for the phases, as can be seen from the jump to 10 or more. (Insert: before modification) The moles of the vapour phase suddenly jump from 0 to 10 when the solver finds a vapour phase (i.e. in the 2-phase region). However, the phase transition for a mixture of components should be gradual. Starting with a tiny bit of vapour at the phase boundary, which gently increases as P,T moves further into the V+L region. See for comparison the graph for the un-modified pseudo-components. I interpret this as an instability in the solver when trying to solve for a condition close to the phase boundary, which seems to be exacerbated when I have modified pseudo-component properties. The latter action may destroy some correlations that normally apply, but I don't know if this is triggering the behavior.	This MSE-SRK case has a hydrocarbon-only stream, and cannot predict vapor appearance at increasing temperature. The Engine uses the successive substitution method with the Rachford-Rice algorithm to solve SRK VLE, however, has a convergence issue. The vapor pseudo-root extrapolation on a supercritical fluid in the SRK subroutine causes the discontinuity and fluctuation in convergence. By changing the SRK subroutine to use identical vapor and liquid roots for supercritical fluid, and tuning the Rachford-Rice algorithm, the solver is able to continuously predict the vapor phase appearance.
2332	Interface	Distillation (assay) data entry does not have the units for the type	Assay data entry now displays the distilled value in volume or mass percent as indicated by the method.
2360	Corrosion	Inflow species values for a corrosion rate calculation were locked when switching to MSE-SRK	Corrosion rates are not value for MSE-SRK. Error was trapped.
2557	Framework	A stream with redox enabled copied from OLI Flowsheet to OLI Studio did not keep the redox species enabled	User interface updated to honor the selections made in the host program.
2593	Corrosion	After using the "Set pH" calculation and then switching back to "Isothermal" the titrant selection is still displayed.	Updated code to track which calctype is set for which survey var/covar is selected. This is used to reset the calctype when the user changes the selection. Also exposed calculation type in the grid.
2714	ScaleChem	CRASH: Program runs and exits without any warning	Found issues with code where crashes could occur and fixed

2719	Framework	Tool tips are missing for contour plots.	This is implemented. We created a OLIToolTipCtrl class that override some of MFCToolTipCtrl functions and fixed the problem that tool tip won't display if control is disabled. Now OLIToolTipCtrl will display tool tip even if control is disabled. The OLIToolTipCtrl is now in the OLIControls project.
2969	Solver	A case with the hardness calculation enabled failed on every other point in MSE. If the restart vector was enabled, then all points converged.	A problem with the call for the hardness calculation was identified and corrected.
2980	Solver	A case with surface complexation enabled (via the database) crashed on the report. The calculation is converged.	When user uses mass fraction or mole fraction, in solid phase we provide total mass or total moles from solid phase. This will end up getting 0 if all solids are in the surface species. To fix this we must know if user is asking for total from solid phase or surface species and provide the correct totals. This is fixed for phase table, true species table and MBG table. Also, the output grid for these sections is display correct values. We have also tested concentration units and they are not affected.
2988	ScaleChem	The brine composition table displays the values in mg/L regardless of unit selection. The column headings do reflect the user choice however.	This is fixed. The old code only allowed mass or mass concentration units to be used for brine table. This is not true anymore as Studio now allows any unit user selected to display the numbers.
2994	Stream Analyzer	If a calculation in volume units fails to converge then the parent stream becomes locked, and thus no new calculations can be added	If converge volume failed the parent stream did not have a chance to get unlocked. This is fixed by unlocking the parent.
2996	ScaleChem	Saturator Calculation failed with heavy hydrocarbons and solid phases	The gas stream is methane dominant, and the condition is in its critical region, i.e. T > 100 C and P > 200 atm. The solver is having an issue to verify as vapor or organic phases since both phase checks passed. The solid inclusion calculation is inconsistent in the organic phase check and not able to converge. The fix is able to make all these three bugs converge.
3274	ScaleChem	A reconciled brine is double-accounting the reconciled ion in the brine report	The ReconcileCalc under brine set result calc to true so it does not have the original input values. When the report requested the inflow values it provided the output values. This is now fixed by using the brine as the input stream to provide the correct input values.
3377	ScaleChem	A solid is missing in the selection list because the first point in the contour plot is zero. If Hide-Zero species is unchecked, then the solid appears.	Fixed issue with the logic when the All-solids option was selected and a solids with a 0 at the first survey point was not showing. Now correctly shows up when hide 0 species is enabled.
3378	ScaleChem	In the plot variable selection list, the Standard solid v. Expanded/All solid filter always reverts back to standard if leaving and returning to the dialog. Once selected it should stay selected.	This is fixed by adding a CSting member in PlotInformation to keep track user selection.
3485	Stream Analyzer	The variable TDS, when enabled, appears in the output tab but not in the report	This is fixed. Now TDS is in reports of Single Point, Survey, and ScaleChem calculations.
3606	Stream Analyzer	The mixer was set up as an isothermal calculation at 23.6 C, yet the flash calculations are being performed at 180C. TDS had been enabled	The mixer case takes in streams in concentration units and need to do volume converge when creating flashes for the streams in the preCalculate() call. During preCalculate() EQTDS was called which changed the GVEC, and later on when the calculate() is called the modified GVEC was used (temperature is 180C). To fix this EQTDS should not be called during preCalculate(). Chris suggested during preCalculate() we should turn off all calc options. The calc options are only for the real calculate() call. After turning off all calc options during preCalculate() the issue is resolved.
3713	ScaleChem	A brine that was copied and then manually updated (as opposed to a deletion) did not reconcile correctly.	This is a bug due to fixing OS-2075: Brine reconciliation had different calculated pH's if calculate alkalinity is checkedDONE in which H2O input value got corrupted. We fixed it by forcing it to be 55.508 mol during post serialization. However this is only true if the brine is in mass concentration units. If brine is in mass fraction units such as ppm the H2O input value can vary. Forcing it to 55.508 mol in post serialization will cause errors. The paste action does end up calling post serialization. To fix it we only make sure H2O is 55.508 when the units are mass concentration. Otherwise don't change H2O value in brine.
3714	Stream Analyzer	Gibbs Free Energy value are reported as zero in report. They are not zero	The Gibbs Free Energy value of each species is non-zero. However, if the amount of a species is 0 in a stream, its Gibbs

			free energy values are not reported. To solve this, I first removed the explicit check of species amount to allow the Gibbs free energy each species to be reported. Then, I also removed the check of the species amount in a particular phase.
3736	Stream Analyzer	Arsenic is missing from possible redox subsystems.	The redox import table that creates the Redox Information table was missing these systems for MSE. The following systems were missing or had incorrect information Arsenic, Bromine, Chlorine, Curium, Mercury, Phosphorus
3788	Stream Analyzer	Enabling the TDS calculation in a mixer give a different titration curve.	This is the same issue as OS-3606: Bad Isothermal Mixer CalculationDONE the TDS calculation is being applied to the inbound streams and changing the temp to 180. This causes the rest of the calculation to be incorrect.
3890	Solver	Using a species with a dimer (acetic acid dimer for example) and MSE-SRK results in a doubling of the mass for the inflow.	The bug is confirmed when the flashed result is in organic-only condition. When the solver copies flash results of the organic phase, it didn't overwrite log(x) variable if x is 0 (to avoid log(0) error). However, it should be overwritten by a very negative number, i.e. -300. After the fix, the organic composition is reasonable without double counting of acetic acid dimer/monomer.
3917	Stream Analyzer	Case created in V10 in mg/L units fails to converge.	Added code to restore missing species and make sure water is not zero in concentration unit.
3931	Corrosion Analyzer	In a case with redox, a sub-system was missing in the drop-down menu from the "RE" button.	This is fixed by making sure the search list obtained valid redox subsystem data. The bug is due to cached redox subsystem is invalid and the name is empty. If this happens we should discard the cached data and look for valid data in the databanks. See attached fixed image.
4037	Stream Analyzer	OLI Studio summary view not showing consistently	Found stray code that prevented this from appearing.
4093	Units	Hardness values are wrong and with wrong units	Changed unit for hardness to 'mg/l as CaCO3' in OLIValues Updated OLIStudio and OLIFlowsheet to correctly set the new unit on reload of case and to remove the hardness value from old cases as it is incorrect.
4115	Solver	CRASH: case that is incorrectly set up quits with no error. This is a set pH calculation with zero water. It is an improperly set up case. The program quits without any kind of error message or stack dump. We should prevent these sudden crashes and warn the user that the case is invalid.	Added check to prevent the crash. Case is invalid but now will catch the failure without crashing.

OLI Flowsheet: ESP / ESP-FS - Features

Bug ID	AREA	Problem	Resolution
3597	Solver	isochoric calculation improvement for OLI Flowsheet	an iterative isochoric calculation method has been implemented [only for flowsheet]. Set as alternative method when regular method fails.

OLI Flowsheet: ESP / ESP-FS - Bug

Bug ID	AREA	Problem	Resolution
612	Import	Copy calculated stream from Studio (redox enabled) and paste-update in Flowsheet, does not carry information for redox	When copying a stream from Studio to Flowsheet the behaviors are explained in the following user options: The stream will be pasted to a new stream in Flowsheet using the default Chemistry Model. The pasted stream will be identical to the source stream and the default Chemistry Model will be merged by source stream's chemistry. Redox will honor the source stream's redox if there is overlap. The stream will be pasted to a new stream in Flowsheet in a new sub Chemistry Model.

			The pasted stream will be identical to the source stream and it uses a newly created Chemistry Model (sub Chemistry Model) in Flowsheet. The default Chemistry Model is not touched. The stream will be pasted to an existing stream in Flowsheet using the default Chemistry Model. The existing stream will be merged with the pasted stream and the default Chemistry Model will be merged by source stream's chemistry. Redox will honor the source stream's redox if there is overlap. The stream will be pasted to an existing stream in Flowsheet in a new sub Chemistry Model. The existing Flowsheet stream will be replaced by the pasted stream and it uses the newly created Chemistry Model (sub Chemistry Model) in Flowsheet. The default Chemistry Model is not touched.
615	Solver	Column heat exchanger duty is not correctly transferred using a heat transfer block. If the exchanger heat duty is varied for a target, the final converged heat duty is not correctly transferred using a heat transfer block. Only the initial estimate is transferred. In the attached case, column initial estimate 1.0 is transferred but not the final converged value of 1.20791e5	Added/corrected logic to transfer heat. There are a few combinations possible such as Transfer in, transfer out. Testers need to test all possible combinations.
1571	Solver	Scaling tendency for Fe3O4 is non-zero when one of the components has a zero flowrate	The bug is in the settler block where scaling tendency indices are messed up. It was double converted to the master model index. After the fix, the output shows the correct scaling index for species.
1584	User Interface	Large cases take a long time to export a report	Tested again and found high latency across VPN connection, updated code to write to a local temporary file and then copy to the network which improved the speed.
2134	User Interface	Could not entirely delete a virtual stream.	When deleting a virtual stream, we must initiate the delete from the parent portal so both the portal and the virtual stream will be deleted.
2190	User Interface	Energy Transfer Block heat duty not displayed in block call-out	User Interface updated.
2391	User Interface	The interaction matrix is not available (is available in OLI Studio)	Added menu item View Interaction Matrix (csv) File to launch user app associated with csv file.
2501	User Interface	The navigator panel does not sort alphabetically when that option is selected.	This option is now properly honored.
2540	User Interface	A stream appears on the PFD but not in the navigator. Cannot delete the stream.	Fixed issue that caused stray/defunct external inlets to a block due to a failed stream reconfigure operation. Added code to handle phantom visual streams from old, saved documents.
2649	Reports	Streams with no liquid phase should not have a zero-pH reported	Report updated to show a blank field in such cases.
2651	Reports	Multi-stream report, when created stream-by-stream, in the order the user wanted is reset when leaving the report	Fixed error in program logic when a stream is added to an empty column of the report.
2800	Framework	A file with reaction kinetics failed to open, program crashed.	There were invalid kinetic parameters in 4 equations. Updated code to ignore these parameters rather than abort the file open.
3004	User Interface	Could not delete a virtual stream (see 2134)	Fixed issue that caused stray/defunct external inlets to a block due to a failed stream reconfigure operation
3132	User Interface	Clearing results should result in a file changed state – the "*" that appears in the title bar.	Added the changed state when clearing results.
3180	User Interface	Pausing a calculation does not allow the user to edit the block that was paused.	Editing now enabled.
3260	User Interface	Multistage block callout did not display the correct stage number when selected	The interface was correct but confusing. It was cleaned up to show how to pick the correct stage.
3305	Solver	Sensitivity plot results do not match analogous case in OLI Studio	This was resolved with using proper restart values.
3308	Solver	Start/Stop/Restart does not work with virtual streams	Updated calculation order fixed when using virtual streams.

3309	User Interface	Enter key does not advance the cursor in sensitivity panels.	Tab/Enter key updated.
3338	User Interface	Hide-zero function does not work in call-outs	The hide-zero functionality was now properly implemented.
3348	User Interface	Cannot use the restart functions for a controller which is connected to an internally manipulated stream	The restart selector algorithm was expanded to search for internally manipulated streams.
3352	Solver	Inconsistent phase predictions at high pressures	The vapor phase starts to appear at higher pressures, and the vapor density shows the phase is from SRK liquid root. When SRK cannot solve vapor root at such high pressures, an extrapolation method is supposed to be used to report high fugacity coefficients. However, this case the SRK subroutine also tried the analytical solution of SRK root and incorrectly used the liquid root. A stability check is added following the new engine implementation and fixed the bug.
3379	User Interface	Feedback controller appears to converge to an incorrect set point with multiple models	The controller should get the master model. Since old ESP does not write block specific chemistry model for the controller (feedback, feedforward, and sensitivity too), the engine makes sure these blocks are run on master model. Flowsheet ties model name to some of these blocks and that creates confusion to the engine. In this case, the controller is tied with a sub-model and that causes the mentioned issue.
3381	User Interface	Pressing Enter on the spec value in a multi-stage column spec/control closes the dialog. It should move to the next available value or button.	Tab/Enter key updated.
3383	User Interface	Earlier versions allowed the direct enter of a stream name in the block panel.	This has been re-enabled.
3402	Solver	Partial molar volume improvement for osmotic pressure calculations - RO membrane side	Some code in RO membrane side needs to be replaced and tested to be consistent with partial molar volume improvement.
3452	Chemistry Model	When MSE-SRK is selected but a non-suitable species is entered a warning should be issued	Database updated and warnings now displayed.
3471	User Interface	A stoichiometric reactor fails without a reliable error message if there are more than 7 reactions.	Added an error flag to inform the user that there can be no more than 7 stoichiometric reactions.
3475	User Interface	A feature that worked in earlier versions, copy-paste a stream call-out fails.	A lot of code modification has happened between v10 and v11. After a thorough code mapping the bug is pinpointed at a few lines of change. Also added is the serialization of m_bUseSrcUnit which makes sure units are honored after paste.
3477	User Interface – Report	A case file has three water analysis sampl. The report for the samples always uses the last sample regardless of the selection.	This is fixed. WaterAnalysisResultsGrid class has a member m_linkWA which contains the valid water analysis object. It was first set in the setReport() function and never changes. When user click the dropdown list to select another water analysis object, m_linkWA is still using the old object. The fix is to update m_linkWA to contain the newly selected water analysis object. This is done in WaterAnalysisResultsGrid::getObject(). The other bug fixed is that water analysis report always shows “Stream” in the header row rather than the actual name of the water analysis object. This is fixed by overriding getTitle() in the WaterAnalysisResultsGrid class to get the correct name.
3480	Solver	A case with isochoric mixers fails but works with standard mixers.	Improved isochoric calculations, see OS-3597
3587	User Interface	Calculation sub-type was not saved if block was configured to be an isochoric calculation.	This was corrected
3588	User Interface	Adding salt rejections as ions to the RO block automatically adds the ions to inflow list	Check to see if species is already in the chemistry model. If not add it. Also check if ions are allowed. This is now fixed.
3592	User Interface	Restarted value for a heat exchanger was many orders of magnitude less than the original value.	Unit conversion error.
3631	User Interface	Heat Exchange set to vapor fraction in mass % units. The value calculated was in mole % units.	Mass % units are not supported. UI updated to accept only mole fraction or mole %

3642	Solver	Sensitivity study returns an error: Subscript out of range on warning vector - crashes engine	Subscripts fixed
3690	User Interface	Call-out for a compressor block was missing some parameters. Denoted with "?"	All parameters now properly populated
3712	User Interface	Direct flow manipulator does not update callout unless you close and reopen	If the block controlling the stream and the stream has the same name, the update does not occur. This confuses the block-order calculation and is now prohibited.
3755	User Interface	Callout for multistage column only reports a single heat exchanger. There are multiple heat exchangers	The interface was updated to make it more intuitive to select multiple exchangers.
3756	Import	Stream copied from OLI Studio (used water analysis) has much different mole flowrates in OLI Flowsheet	Since the source stream's inflows were in mass-by-vol conc. basis which are not supported in Flowsheet they were converted to mass basis. However, they were not being scale to the total stream amount (even though they would be automatically scaled during calc time as the total stream was correctly overridden). Modified stream paste logic to translate inflows in mass-by-vol or mole-by-vol conc. basis into mass-fraction/mole-fraction basis as it would be the closest substitution of the original inflow amounts.
3761	Solver	Direct flow manipulator versus traditional manipulator gives vastly different results - UI work for unique block and stream names where necessary	This is fixed by enforcing unique name for controller's target streams. It is generally allowed for a stream and a block to share a same name. However, for a controller's target stream the name must be unique. When opening an existing file this rule will be applied by checking all controller's target streams. Errors will be flagged if duplicate names are found. User must fix them before calculation can proceed. On the other hand, if a user tries to change the name of a stream or a block the same rule will be applied if the system has target stream of controllers. See OS-3712
3766	Solver	Zero enthalpy reported for liq2 only calculation	Fixed a new bug for not calculating enthalpy for Liq2 stream, and Corrected a previously fixed bug showing some extractor cases failing.
3779	User Interface	Add Electro neutralities information to in the definition tab to Water Analysis tool in Flowsheet	Added electroneutrality information and other calculated properties to the calculated results.
3780	User Interface	Feedback controller target should not allow connecting to block - stop in UI	The target object of a feedback controller (input to the controller) should be stream object only. The flowsheet view does allow user to drag and drop on a block object, which will cause an error. Now the code has prevented the drag and drop on a block object.
3781	User Interface	Clear results deletes the column restart data for flowsheet	Modified logic for the "clear results" action to not clear tower restart data.
3809	Chemistry Model	Ions entered in chemistry inflow grid are not displayed with the "erroneous inflow" formatting	In chemistry inflows entry grid added logic to identify ions that may have been entered by the user and use "erroneous" formatting to flag them. An error tooltip is also shown for inflows that are ions.
3880	User Interface	Turbine default efficiency is empty for old cases opening in V11, showing error - new cases not running too	Corrected handling of default values for the 3 different types of efficiencies in the Turbine's specification.
3935	User Interface Reports	The Case file uses ion exchange. The Adsorbed View table displays the materials on the surface species. The S-5 table contains the surface MBG and Combined MBG. The surface variables are zero. This is due to a units Manager issue. The Report 2 will contain the values that should be present.	This is fixed: (1) The MBG callout will display correct info now. (2) if there is no Aq phase and user wants to use concentration or molar concentration units, we will automatically change to mass fraction or molar fraction units to accommodate the stream with no Aq phase. Please see attached before and after images for Bug(1) and Bug(2).
3937	Solver	This case has two models Chemistry (default) and REDOX. One includes iron redox. If I set one block to REDOX, the block fails (much further upstream)	When a new chemistry model is introduced into the process, the structure of the saved restart vectors becomes inconsistent with the new vectors setup by the Engine. Added logic in start/stop/restart optimizations code to properly handle such situations.
3939	User Interface & Solver	Feedback controller and target heat duty in a heat exchanger are not using the same set of units.	Wrong blmain units were being retrieved when converting feedback controller's user-specified param bounds for writing to bin file.

4005	Solver	Disabled controllers in case file still report as having not converged.	Disabled controller reported to fail in error. Dispatch object update notification to ensure observers are notified when list of calc-errors is changed. Also skip reporting special feedback controller converge fail error if said controller is no longer enabled.
4050	User Interface	Flowsheet UI freezes when the definition pane for a block is visible while a simulation is running for a very large flowsheet.	The block's spec grid was updating constantly when any flowsheet object's calculation state changed during the simulation. This blocked other UI updates from happening and the UI appeared frozen until the calculation finished. Narrowed down the filter for events that triggered an update of BlockSpecGrid to prevent unneeded updates.
4078	Solver	Error in multiple models (to be fixed in a later version) crashed and did not exit gracefully	Error not properly trapped. Program does not crash but still persists in this version.
4093	Units	Hardness values are wrong and with wrong units	Changed unit for hardness to 'mg/l as CaCO3' in OLIValues Updated OLIStudio and OLIFlowsheet to correctly set the new unit on reload of case and to remove the hardness value from old cases as it is incorrect.
4103	Solver	Program hangs when using a water analysis object	Deadlock when water analysis calc is running. Keep cached copy of dependency chem model so that getChemistryModel() is not called unnecessarily. Calling getChemistryModel() may be computationally expensive if the source water analysis's chem model needs to be synchronized.
4131	User Interface	A controller parameter set was not found in the species list. This was an ion concentration in a 2nd liquid phase in MSE-SRK which has no ions in the 2nd liquid phase.	We are incorrectly writing CLIONAQO to the bin file it should be written as CLIONO
4142	User Interface	Calculation failed in converge volume. No Trace File	Updated code to enable trace file for the converge file calculation (if enabled in parent) and to show converge volume failed if that is the case.
4172	Import	Importing a case from ESP Original had a stream in mole fraction units. There was no water present in the stream. A mole fraction of 1 was added for water on import.	Error in stream composition after import: Fixed issue with import defaulting water to value of 1 when fractional units are specified and since the stream did not have an entry for 0 WATER the water remained at 1. Now explicitly check if water is included in the incoming stream and if not explicitly 0 the entry for water. Oddly, this worked inversion 9.6 but not in version 10
4185	Solver	Program crashed with an "Unexpected Way" message, suspect too many water samples	Found issue, when setting units in a water analysis you can check the option to use these units for all new objects, this allows new flowsheet objects(Mixers…) to be concentration. This was found to be caused by concentration units being set for a mixer block which is invalid. It was tracked down to the units Manager allowing Water Analysis units to be set as the default for the document. Updated the Units manager to hide this option when it is a Water Analysis object.

Alliance Products - Features

Bug ID	Program	Problem	Resolution
----	Petro-Sim	Installation of version 11 of the OLI Engine will not work with Petro-Sim v7.1 or earlier	This is a change enforced by KBC (publisher of Petro-Sim). The OLI Engine version 11.x will only work with v7.2 of Petro-Sim or later.
3983	Unisim Design	OLI Configuration tool did not understand about Unisim Design R40.1 and R490	XML file updated

Alliance Products - Bugs

Bug ID	Program	Problem	Resolution
3192	Petro-Sim	If you open up an existing OLI case in PetroSim and click the about button for OLI, prior to any other operation it will crash.	Added protection code around pointers used for the about dialog.

3741	Aspen Plus	Very different results when a zero flowrate species is included in the stream	Updated initializer to enable organic phase check. Initial tests ran OK. Need to run against release tests with new databanks.
3999	Petro-Sim	Redox not being honored in model creation in Petro-SIM using chemistryBuilder	This is a bug in the chemistry builder that need to rebuild the system as needed when specifying redox. It's working correctly after the fix.
4014	Petro-Sim	KBC chemistry builder redox subsystem incorrect for hydrogen/oxygen	In current redox logic, H2O redox is shown when H2 or O2 is in inflow. It is redesigned that H2 will not bring in H2O redox, and O2 brings in redox options for ozone and H2O2. Additionally, redox subsystems like FEEL are selected by default based on databank information. This feature was not there. Also added function to get databank full name for display.

OLI Chemistry Wizard (all products)

Bug ID	Program	Problem	Resolution
733	All	The Chemistry Wizard for assays should reflect the proper units. For example, the percent distilled for method D2887 should be weight percent and we report volume percent.	Resolved for OLI Studio OS-2332
3547	All	Read MOD files without making any changes to them. Honor DEFINE equations	If a cws file is created from a mod file containing user defined equations, these equations will be added to the cws file. When a new mod file is generated from the cws file, these equations will be written to the new mod file.
3645	Regression	CRASH: Chemistry Wizard for Regression crashes out without error message	Tracked down to an issue in dbAutoSQL.for, array for redoxSpecies was allocated to the number of species which is not large enough for this case. Changed to allocate number of species*4. Test and issue resolved.
3882	All	Chemistry wizard looks at the old options to determine if MSE and SRK are enabled. This needs to be updated.	Updated code to use databank info from DataProvider, and to stop looking at the license. DataProvider only returns licensed databanks.
3972	All	Chemistry wizard crashes in autogen with selecting default Redox for many species	This is caused by the same problem as OS-4015: Chemistry wizard brings in ammonia related species N2 inflow, redox turn on but no redox subsystems selectedDONE that Engine tries to include all missing redox systems when the redox is turned on but no subsystems are selected. It is fixed together with the other Jira story.
4002	All	Crash when selecting default REDOX for Ti species	Arrays updated to accommodate the size needed.
4174	gProms	Incorrect error message when using a private database	All databases are now stored in My OLI Cases/Databanks. This check is no longer needed.

OLI Developer Edition - General

Bug ID	Program	Problem	Resolution
		There were no upgrades except for overall solver/engine upgrades	

OLI Framework - General

Bug ID	Program	Problem	Resolution
3074	Security	Add new options in the license to support Database Segmentation, Databook and Regress, Flowsheet Pkg Publishing, named user flag	This is being deployed to new customers of OLI
3896	Support	Update Contact support to Show Portal not Support email	Update screens to show the portal and wiki , not email and wiki
3968	Security	Licenses for third-part software was out of date	Updated the licenses and copyright data in the security tab.
4190	Security	Named Users does not work for OLI Flowsheet	Named Users log in used the wrong screen. Now updated.