MERCK

Illuminated Synthesis

Sigma-Aldrich®
Lab & Production Materials

Photoredox catalysis and photoreactors enable reproducibility in your research.

Chemists have long struggled with reproducibility in photoredox catalysis. Both varied reaction setups and individual reactions performed with the same setup can be tricky. Our new labware seeks to alleviate these issues by providing photoreactors for each stage of reaction development while ensuring high levels of consistency across reactions and between runs. When combined with our broad portfolio of iridium and ruthenium catalysts and acridinium-based photocatalysts, these tools free synthetic chemists to focus on their next breakthrough.

Catalyst Screening

The Photo KitAlysis™ high-throughput reaction screening platform enables chemists to quickly and efficiently find good reaction conditions for a wide range of photoredox-catalyzed reactions.

Photo KitAlysis™ high-throughput reaction controller and blue, green, and white arrays.

Features include:

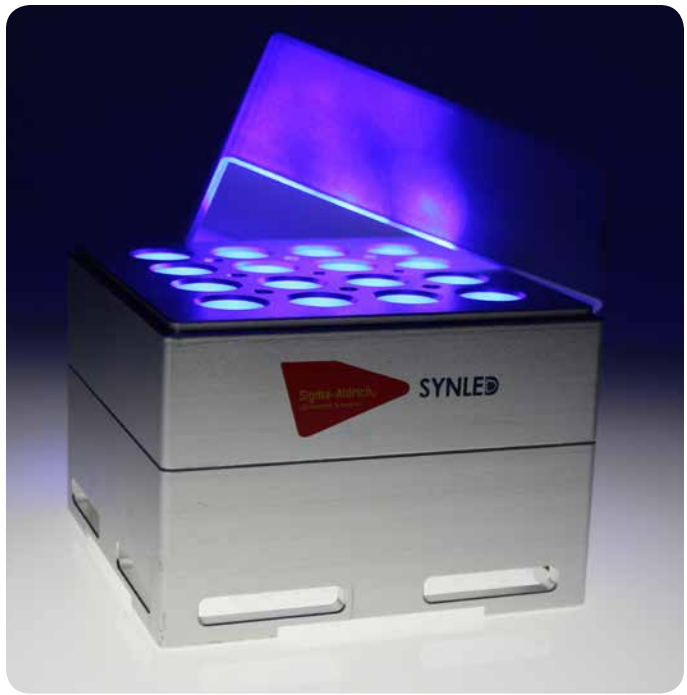
- Microscale format; only ~100 mg of each substrate to run 24 unique reactions
- 24 pre-weighed catalysts in glass microvials loaded with stir bars and topped with cap mat
- LED controller allows variable output between 0–30 mA
- Three different LED light sources available: blue, green, and white light

Catalyst Screening

Cat. No.	Product Description
Z742612	Photo KitAlysis™ Starter Kit: LED controller, blue LED array, 24-well reaction block, and screwdriver
Z742608	Photo KitAlysis™ 24—Green LED array
Z742609	Photo KitAlysis™ 24—White LED array
KITALYSIS-PHO	Photo KitAlysis™ High-throughput reaction screening kit

Reaction Optimization

The SynLED parallel photoreactor was designed to facilitate reaction optimization as well as rapid library synthesis ensuring high levels of consistency across reactions and between runs.



SynLED parallel photoreactor (Z742680)

Features include:

- Bottom-lit LEDs (465–470 nm) across a 4 × 4 reaction block array provides consistent light intensity (130–140 lm) and angle (45°)
- Built-in cooling fan provides consistent temperature for each parallel reaction
- Compatible with 1–2 dram scintillation vials or microwave vials
- Designed to fit on a conventional stir plate; includes a round cutout to fit firmly on IKA brand stir plates

Scale-Up

The Penn PhD Photoreactor m2 is a benchtop instrument designed for you to accelerate chemical reactions using photoredox catalysis. The Photoreactor m2 combines LED illumination, mechanical stirring, and cooling into one device. Define parameters of temperature, intensity, stir rate and time to improve repeatability, traceability, efficiency, and consistency of your results. The Photoreactor m2 allows you to streamline synthetic sequences and create valuable strategies for addressing some of the challenges of molecule construction in drug discovery.

Penn PhD Photoreactor m2 (Z744031)

Features include:

- Complete benchtop instrument
- Modular design can be used at a variety of wavelengths from 365–450 nm.
- 360-degree reflective environment maximizes surface-area photon capture.
- Light shield interlock prevents user exposure to harmful rays.
- Interactive touch screen controls reaction parameters.
- Intertek ETL, CE, and CB approved for safety, quality, and performance.
- User defined parameters: temperature, light intensity, fan speed, and stirring
- Auto stop, pause, and reset options
- Supports gas chromatography vial sizes 4, 8, 20, and 40 ml.
- Temperature feedback using a k-type thermocouple

Scale-Up

Cat. No.	Product Description
Z744035	Penn PhD Photoreactor M2 with 450 nm LED light module
Z744031	365 nm LED light module
Z744032	420 nm LED light module
Z744033	450 nm LED light module

Iridium Catalysts

Cat. No.	Product Description
747769	$[Ir(dtbbpy)(ppy)_2]PF_6$
658383	$[(ppy)_2IrCl]_2$
804215	$[Ir\{dFCF_3ppy\}_2(bpy)]PF_6$
747793	$(Ir[dF(CF_3)ppy]_2(dtbpy))PF_6$
902217	$Ir[dFFppy]_2$-(4,4′-dCF_3bpy)PF_6
902225	$Ir[dFMeppy]_2$-(4,4′-dCF_3bpy)PF_6
901409	$[Ir(dF(Me)ppy)_2(dtbbpy)]PF_6$
900538	$Ir(p\text{-}F\text{-}ppy)_3$
900538	$Ir(ppy)_3$
688096	$Ir[p\text{-}F(t\text{-}Bu)\text{-}ppy]_3$
900539	$Ir[dF(t\text{-}Bu)\text{-}ppy]_3$
900540	$Ir(dFppy)_3$
901368	$[Ir(dFppy)_2(dtbbpy)]PF_6$

Ruthenium Catalysts

Cat. No.	Product Description
90819	$Ru(bpy)_2(phen\text{-}5\text{-}NH_2)(PF_6)_2$
343714	Dichlorotris(1,10-phenanthroline)ruthenium(II) hydrate
747785	$[Ru(bpm)_3][Cl]_2$
754730	$Ru(bpy)_3(PF_6)_2$
224758	$Ru(bpy)_3Cl_2$

Acridinium-Based Photocatalysts

Cat. No.	Product Description
900694	10-(3,5-Dimethoxyphenyl)-9-mesityl-1,3,6,8-tetramethoxyacridin-10-ium tetrafluoroborate
900421	9-Mesityl-3,6-di-tert-butyl-10-phenylacridinium tetrafluoroborate
793876	9-Mesityl-2,7-dimethyl-10-phenylacridinium tetrafluoroborate
747610	9-Mesityl-10-methylacridinium perchlorate
794171	9-Mesityl-10-methylacridinium tetrafluoroborate
793221	9-Mesityl-10-phenylacridinium tetrafluoroborate
900693	9-Mesityl-1,3,6,8-tetramethoxy-10-phenylacridin-10-ium tetrafluoroborate

Sigma-Aldrich®

Lab & Production Materials

Merck KGaA
Frankfurter Strasse 250
64293 Darmstadt, Germany

SigmaAldrich.com

Other Organic Photocatalysts and Ligands

Cat. No.	Product Description
798819	(S)-*N*-Butyl-1-[(*S*)-2-((*E*)-2-hydroxybenzylideneamino)-3-methylbutanoyl]pyrrolidine-2-carboxamide
901111	3,7-Di(4-biphenyl) 1-naphthalene-10-phenoxazine
902829	2-(2,4-Difluorophenyl)-5-methylpyridine
902802	2-(2,4-Difluorophenyl)-5-fluoropyridine
902810	4,4′-Bis(trifluoromethyl)-2,·2′-bipyridine
901112	5,10-Di(2-Naphthyl)-5,10-dihydrophenazine
901466	Mes-Umemoto reagent
902136	2,4,6-Tri-(4-fluorophenyl)pyrylium tetrafluoroborate
900692	2,4,6-Tris(4-methoxyphenyl)pyrylium tetrafluoroborate

Find these photoredox catalysis products as well as technology spotlights and application notes on **SigmaAldrich.com/photocatalysis**.

Simply search for a product by catalog number to access full details and related articles.

We're dedicated to supporting all your explorations with 300,000 best-in-class lab and production materials, services, and technical resources.

To place an order or receive technical assistance in Europe, please call Customer Service:
France: 0825 045 645
Germany: 069 86798021
Italy: 848 845 645
Spain: 901 516 645 Option 1
Switzerland: 0848 645 645
United Kingdom: 0870 900 4645

For other countries across Europe, please call: +44 (0) 115 943 0840
Or visit: **SigmaAldrich.com/offices**
For Technical Service visit: **SigmaAldrich.com/techservice**

Lit. No. MK_BR3327EN Ver. 0.0
2018 - 18261
02/2019