Photochemistry Publications

The following (non-exhaustive) list of papers shows peer reviewed work that has been published using the Vapourtec R-Series and E-Series flow chemistry systems for photochemistry applications. As new work is continually published, please check on our website for updates.

Batch Versus Flow Lithiation-Substitution of 1,3,4-Oxadiazoles: Exploitation of Unstable Intermediates Using Flow Chemistry
Jeff Y. F. Wong, John M. Tobin, Filipe Vilela and Graeme Barker*
Institute of Chemical Sciences, Heriot-Watt University, Edinburgh EH11 4AS, Scotland, UK.
https://onlinelibrary.wiley.com/doi/abs/10.1002/chem.201902917

A Photoredox Coupling Reaction of Benzylboronic Esters and Carbonyl Compounds in Batch and Flow
Yiding Chen†, Oliver May†, David C. Blakemore‡ and Steven V. Ley†*
† Department of Chemistry, University of Cambridge, Lensfield Road, Cambridge CB2 1EW, U.K.
‡ Medicine Design, Pfizer Inc., Eastern Point Road, Groton, Connecticut 06340, United States
https://pubs.acs.org/doi/full/10.1021/acs.orglett.9b02307

Conjugated porous polymers for photocatalytic applications
Y. L. Wong [a], J. M. Tobin [b], Z. Xu [a], F. Vilela [*b]
[a] Department of Biology and Chemistry, City University of Hong Kong, 83 Tat Chee Avenue, Kowloon, Hong Kong
[b] School of Engineering and Physical Sciences, Heriot Watt University, Edinburgh, UK
https://pubs.rsc.org/en/content/articlelanding/2016/ta/c6ta07697a#!divAbstract

A Simple and Efficient Flow Preparation of Pyocyanin a Virulence Factor of Pseudomonas Aeruginosa
Frederik B. Mortzfeld[a,b], Jörg Pietruska[b], and Ian Baxendale*[a]
[a]Department of Chemistry, University of Durham, South Road, Durham, Durham, DH1 3LE, UK.
[b]Institut für Bioorganische Chemie, Heinrich-Heine-Universität Düsseldorf im Forschungszentrum Jülich, 52425, Jülich, Deutschland.
https://onlinelibrary.wiley.com/doi/full/10.1002/ejoc.201900526

Visible light-promoted Fe-catalyzed Csp2-Csp3 Kumada cross-coupling in flow
Xiao-Jing Wei, Irini Abdiaj, Carlo Sambiagio, Chenfei Li, Eli Zysman-Colman, Jesus Alcazar, Timothy Noel
Department of Chemical Engineering and Chemistry, Micro Flow Chemistry and Synthetic Methodology, Eindhoven University of Technology, Den Dolech 2, 5612 AZ, Eindhoven, The Netherlands
https://onlinelibrary.wiley.com/doi/abs/10.1002/anie.201906462

Practical and regioselective amination of arenes using alkyl amines
Alessandro Ruffoni [1], Fabio Juliá [1], Thomas D. Svejstrup [1], Alastair J. McMillan [1], James J. Douglas [2] & Daniele Leonori [1]
[1] School of Chemistry, University of Manchester, Oxford Road, Manchester M13 9PL, UK.
[2] Early Chemical Development, Pharmaceutical Sciences, IMED Biotech Unit, AstraZeneca, Macclesfield SK10 2NA, UK
https://www.nature.com/articles/s41557-019-0254-5#Sec216

Additive manufacturing of photoactive polymers for visible light harvesting
Adilet Zhakeyev[ac], John Tobin[a], Huizhi Wang[b], Filipe Vilela[a], Jin Xuan[ac]
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[c] Department of Chemical Engineering, Loughborough University, Loughborough, UK
https://www.sciencedirect.com/science/article/pii/S1876610219306034

Protection-Group-Free Synthesis of Sequence-Defined Macromolecules via Precision λ-Orthogonal Photochemistry
Waldemar Konrad, Christian Fengler, Sarrah Putwa, and Christopher Barner-Kowollik*
Macromolecular Architectures, Institut für Technische Chemie und Polymerchemie, Karlsruhe Institute of Technology (KIT), Engesserstr. 18, 76131 Karlsruhe, Germany
School of Chemistry, Physics and Mechanical Engineering, Queensland University of Technology (QUT), 2 George Street, QLD, 4000 Brisbane, Australia
https://onlinelibrary.wiley.com/doi/abs/10.1002/anie.201901933

Decarboxylative Intramolecular Arene Alkylation Using *N*-(Acyloxy)phthalimides, an Organic Photocatalyst, and Visible Light

Trevor C. Sherwood*[†], Hai-Yun Xiao*[†], Roshan G. Bhaskar[†], Eric M. Simmons[‡], Serge Zaretsky[‡], Martin P. Rauch[§], Robert R. Knowles[§], and T. G. Murali Dhar[†]

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https://pubs.acs.org/doi/abs/10.1021/acs.joc.9b00432

Visible Light-Promoted Beckmann Rearrangements: Separating Sequential Photochemical and Thermal Phenomena in a Continuous Flow Reactor

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https://onlinelibrary.wiley.com/doi/abs/10.1002/ejoc.201900231

Towards a Scalable Synthesis of 2-Oxabicyclo[2.2.0]hex-5-en-3-one Using Flow Photochemistry

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https://onlinelibrary.wiley.com/doi/abs/10.1002/cptc.201900017

Rapid Photochemical Reaction Studies under Continuous-flow Conditions in the Vapourtec UV-150 Reactor-A Technical Note

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https://www.ingentaconnect.com/contentone/ben/coc/2018/00000022/00000025/art00006

Enabling synthesis in fragment-based drug discovery by reactivity mapping: photoredox-mediated cross-dehydrogenative heteroarylation of cyclic amines

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https://pubs.rsc.org/en/Content/ArticleLanding/2019/SC/C8SC04789H#!divAbstract

De novo design of organic photocatalysts: bithiophene derivatives for the visible-light induced C-H functionalization of heteroarenes

Cecilia Bottecchia [1], Raul Martin [2], Irini Abdiaj [3], Ettore Crovini [4], Jesus Alcazar [3], Jesus Jorduna, Maria Blesa, Jose Carrillo [2], Pilar Prieto, Timothy Noel [1]

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https://onlinelibrary.wiley.com/doi/abs/10.1002/adsc.201801571

Recent Advances in Photodecarboxylations Involving Phthalimides

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http://www.publish.csiro.au/CH/CH18220

C–H functionalisation of aldehydes using light generated, non-stabilised diazo compounds in flow†

Paul Dingwall [a], Andreas Greb [a], Lorène N. S. Crespin [a], Ricardo Labes [a], Biagia Musio [a], Jian-Siang Poh [a], Patrick Pasau [b], David C. Blakemore [c] and Steven V. Ley *[a]
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https://pubs.rsc.org/en/content/articlehtml/2018/cc/c8cc06202a

Photoinduced Palladium Negishi Cross-Coupling Through Visible Light Absorption of Palladium-Organozinc complexes
Irini Abdiaj[a], Lena Huck[a,b], José Miguel Mateo[b], Antonio de la Hoz[b], M. Victoria Gomez[c], Angel Díaz-Ortiz[b], and Jesús Alcázar [a *]
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https://onlinelibrary.wiley.com/doi/abs/10.1002/anie.201808654

Three-component assembly of multiply substituted homoallylic alcohols and amines using a flow chemistry photoreactor
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https://pubs.acs.org/doi/10.1021/acs.orglett.8b02907

Continuous Flow Photochemical Benzylic Bromination of a Key Intermediate in the Synthesis of a 2-Oxazolidinone
Y Chen, O de Frutos, C Mateos, JA Rincon, D Cantillo, C Olivier Kappe
https://onlinelibrary.wiley.com/doi/abs/10.1002/cptc.201800114

Dichlorophenylacrylonitriles as AhR Ligands displaying selective breast cancer cytotoxicity in vitro
Jennifer R Baker[1], Jayne Gilbert[2], Stefan Paula[3], Xiao Zhu[3], Jennette A Sakoff[2], Adam McCluskey[1]
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https://onlinelibrary.wiley.com/doi/abs/10.1002/cmdc.201800256

Combining C-H functionalisation and flow photochemical heterocyclic metamorphosis (FP-HM) for the synthesis of benzo[1,3]oxazepines
Jasraj S. Babra, Andrew T. Russell, Christopher D. Smith, Yuxiong Zhang
Department of Chemistry, University of Reading, Whiteknights, Reading, RG6 6AD, UK
https://www.sciencedirect.com/science/article/pii/S0040402018306148

Photochemical Synthesis of Heterocycles: Merging Flow Processing and Metal-Catalyzed Visible Light Photoredox Transformations
T Glasnov
Institute of Chemistry, University of Graz, Graz, Austria
https://link.springer.com/chapter/10.1007/7081_2018_20

Photoredox Iridium–Nickel Dual-Catalyzed Decarboxylative Arylation Cross-Coupling: From Batch to Continuous Flow via Self-Optimizing Segmented Flow Reactor
Hsiao-Wu Hsieh[†], Connor W. Coley[‡], Lorenz M. Baumgartner[‡], Klavs F. Jensen*[‡], and Richard I. Robinson*[†]
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https://pubs.acs.org/doi/abs/10.1021/acs.oprd.8b00018

Generation of Diversity Sets with High sp3 Fraction Using the Photoredox Coupling of Organotrifluoroborates and Organosilicates with Heteroaryl/Aryl Bromides in Continuous Flow
Kevin D Raynor, Gregory D May, Upul K. Bandarage, and Michael J. Boyd

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https://www.ncbi.nlm.nih.gov/pubmed/29281285

Exploring effects of intermittent light upon visible light promoted water oxidations
Dominic Walsh*[a], Pascaline Patureau[a], Karen Robertson[a], Shaun Reeksting[b], Anneke Lubben[b], Salvador Eslava[c] and Mark T. Wellera[a]
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http://pubs.rsc.org/en/content/articlepdf/2017/se/c7se00304h

A nanoporous graphene analog for superfast heavy metal removal and continuous-flow visible-light photoredox catalysis
Ran Xiao[a], John Michael Tobin[b], Meiqin Zha[a], Yunlong Hou[a], Jun He[c], Filipe Vilela*[b] and Zhengtao Xu*[a]
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http://pubs.rsc.org/en/content/articlelanding/2017/ta/c7ta05534j#!divAbstract

Visible-light-induced trifluoromethylation of highly functionalized arenes and heteroarenes in continuous flow
Irini Abdiaj[a], Cecilia Bottecchia[b], Jesus Alcazar*[a], Timothy Noël*[b]
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https://www.thieme-connect.com/products/ejournals/html/10.1055/s-0036-1588527

High throughput photo-oxidations in a packed bed reactor system
Caleb J.Kong, DanielFisher, Bimbisar K.Desai,. YuanYang, Saeed Ahmad, Katherine Belecki, B. Frank Gupton
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http://www.sciencedirect.com/science/article/pii/S0968089617313627

Continuous Flow α‐Arylation of N,N‐Dialkylhydrazones under Visible-Light Photoredox Catalysis
Juan A. Vega, José Manuel Alonso, Gabriela Méndez, Myriam Ciordia, Francisca Delgado, and Andrés A. Trabanco
Neuroscience Medicinal Chemistry, Janssen Research & Development, Jarama 75A, 45007 Toledo, Spain
http://pubs.acs.org/doi/ipdf/10.1021/acs.orglett.7b00117

Active Site-Mapping of Xylan-Deconstructing Enzymes with Arabinoxylan Oligosaccharides Produced by Automated Glycan Assembly
Deborah Senf, Colin Ruprecht, Goswinus de Kruijff, Sebastian Simonetti, Frank Schuhmacher, Peter Seeberger, Fabian Pfrengle
Max-Planck-Institute of Colloids and Interfaces, Biomolecular Systems, Potsdam, Germany
http://onlinelibrary.wiley.com/doi/10.1002/chem.201605902/full

Mixed-Linkage Glucan Oligosaccharides Produced by Automated Glycan Assembly Serve as Tools to Determine the Substrate Specificity of Lichenase
Pietro Dallabernardina, Frank Schuhmacher, Peter H Seeberger, Fabian Pfrengle
Max-Planck-Institute of Colloids and Interfaces, Biomolecular Systems, Potsdam, Germany
http://onlinelibrary.wiley.com/doi/10.1002/chem.201605479/full

Improving the throughput of batch photochemical reactions using flow: Dual photoredox and nickel catalysis in flow for C(sp^2) C(sp^3) cross-coupling
Irini Abdiaj, Jesús Alcázar
Janssen Research and Development, Janssen-Cilag, S.A., C/Jarama 75, 45007 Toledo, Spain
http://www.sciencedirect.com/science/article/pii/S096808961631495X

Synthesis of Cycloalkyl Substituted 7-Azaindoles via Photoredox Nickel Dual Catalytic Cross-Coupling in Batch and Continuous Flow
Natalie Palaychuk, Travis J. DeLano, Michael J. Boyd, Jeremy Green, and Upul K. Bandarage

Vertex Pharmaceuticals Incorporated, 50 Northern Avenue, Boston, Massachusetts 02210, United States
http://pubs.acs.org/doi/abs/10.1021/acs.orglett.6b03223?journalCode=orlef7

Acridinium-Based Photocatalysts: A Sustainable Option in Photoredox Catalysis
Amruta Joshi-Pangu[†], François Lévesque[†], Hudson G. Roth[‡], Steven F. Oliver[†], Louis-Charles Campeau[†], David Nicewicz[‡], and Daniel A. DiRocco*[†]
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http://pubs.acs.org/doi/abs/10.1021/acs.joc.6b01240?journalCode=joceah

Application of the Photoredox Coupling of Trifluoroborates and Aryl Bromides to Analog Generation Using Continuous Flow
Travis J. DeLano, Upul K. Bandarage, Natalie Palaychuk, Jeremy Green, and Michael J. Boyd
Vertex Pharmaceuticals Incorporated, 50 Northern Avenue, Boston, Massachusetts 02210, United States
http://pubs.acs.org/doi/abs/10.1021/acs.joc.6b02408?journalCode=joceah

Expedited access to thieno[3,2-c]quinolin-4(5H)-ones and benzo[h]-1,6-naphthyridin-5(6H)-ones via a continuous flow photocyclization method
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http://pubs.rsc.org/-/content/articlelanding/2016/ob/c6ob02279k#!divAbstract

BODIPY-based conjugated microporous polymers as reusable heterogeneous photosensitisers in a photochemical flow reactor
J. M. Tobin,[a] J. Liu,[b] H. Hayes,[a] M. Demleitner,[a] D. Ellis,[a] V. Arrighi,[a] Z. Xu*[b] and F. Vilela*[a]
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http://pubs.rsc.org/en/content/articlelanding/2016/py/c6py01393g#!divAbstract

Visible light activation of Boronic Esters enables efficient photoredox C(sp^2)–C(sp^3) cross-couplings in flow
Fabio Lima[a], Dr. Mikhail A. Kabeshov[a], Dr. Duc N. Tran[a], Dr. Claudio Battilocchio[a], Dr. Joerg Sedelmeier[b], Dr. Gottfried Sedelmeier[b], Dr. Berthold Schenkel[b], Prof. Steven V. Ley*[a]
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http://onlinelibrary.wiley.com/doi/10.1002/anie.201605548/full

A laboratory-scale continuous flow chlorine generator for organic synthesis
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http://pubs.rsc.org/en/content/articlelanding/2016/re/c6re00135a/unauth#!divAbstract

Aryl amination using ligand-free Ni(II) salts and photoredox catalysis
Emily B. Corcoran[1], Michael T. Pirnot[2], Shishi Lin[3], Spencer D. Dreher[3], Daniel A. DiRocco[3], Ian W. Davies[3], Stephen L. Buchwald[2],*, David W. C. MacMillan[1],*
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[3] Department of Process Chemistry, Merck Research Laboratories, Rahway, NJ 07065, USA
http://science.sciencemag.org/content/early/2016/06/22/science.aag0209

Metal-free borylation of electron-rich aryl(pseudo)halides under continuous-flow photolytic conditions
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[b] Department of Chemistry, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, China
http://pubs.rsc.org/en/content/articlelanding/2016/qo/c6qo00109b#!divAbstract

A scalable and operationally simple radical trifluoromethylation
Joel W. Beatty[1], James J. Douglas[1,2], Kevin P. Cole[2] ,Corey R. J. Stephenson[1,]
[1] Department of Chemistry, University of Michigan, Ann Arbor, Michigan 48109, USA
[2] Small Molecule Design and Development, Lilly Research Laboratories, Eli Lilly and Company, Indianapolis, Indiana 46285, USA
http://www.nature.com/ncomms/2015/150810/ncomms8919/full/ncomms8919.html

Photoactive and metal-free polyamide-based polymers for water and wastewater treatment under visible light irradiation
Junjie Shen[a], Roman Steinbach[a], John Tobin[a], Mayumi Mouro Nakata[a], Matthew Bower[b], Martin McCoustra[a], Helen Bridle[a], Valeria Arrighi[a], Filipe Vilela[a]
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http://www.sciencedirect.com/science/article/pii/S0926337316302818

Continuous flow photo-initiated RAFT polymerisation using a tubular photochemical reactor
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[a] CSIRO Manufacturing, Bag 10, Clayton South, Victoria 3169, Australia
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http://www.sciencedirect.com/science/article/pii/S0014305716300325

Efficient metal-free photochemical borylation of aryl halides under batch and continuous-flow conditions†
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Center for Organic Chemistry, Frontier Institute of Science and Technology (FIST), Xi'an Jiaotong University, 99 Yanxiang Road, Xi'an, Shaanxi 710054, China
http://pubs.rsc.org/en/content/articlehtml/2016/sc/c5sc04521e

Continuous flow photochemistry as an enabling synthetic technology: synthesis of substituted-6(5*H*)-phenanthridinones for use as poly (ADP-ribose) polymerase inhibitors
Y. Fang[a] and G. K. Tranmer*[ab]
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http://pubs.rsc.org/en/content/articlelanding/2014/md/c5md00552c#!divAbstract

Visible-light photoredox catalysis using a macromolecular ruthenium complex: reactivity and recovery by size-exclusion nanofiltration in continuous flow†
Javier Guerra [ab]**,** David Cantillo [a] and C. Oliver Kappe ***[a]**
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http://pubs.rsc.org/en/content/articlehtml/2016/cy/c6cy00070c

Light-induced C-H arylation of (hetero)arenes by in situ generated diazo anhydrides
Dr. David Cantillo[1], Dr. Carlos Mateos[2], Dr. Juan A. Rincon[2], Dr. Oscar de Frutos[2,*] and Prof. Dr. C. Oliver Kappe[1,*]
Institute of Chemistry, University of Graz, NAWI Graz, Heinrichstrasse 28, 8010 Graz (Austria)
Centro de Investigación Lilly S. A. Avda. de la Industria 30, 28108 Alcobendas-Madrid (Spain)
http://onlinelibrary.wiley.com/doi/10.1002/chem.201502357/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage=

Photodecarboxylative benzylations of N-methoxyphthalimide under batch and continuous-flow conditions
Hossein Mohammadkhani Pordanjani [A B], Christian Faderl [A C], Jun Wang [A], Cherie A. Motti [D], Peter C. Junk [A] and Michael Oelgemöller [A E]
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http://www.publish.csiro.au/?paper=CH15356

Reevaluation of the 2-nitrobenzyl protecting group for nitrogen containing compounds: an application of flow photochemistry
Chloe I. Wendell, Michael J. Boyd,
Vertex Pharmaceuticals Inc., 50 Northern Avenue, Boston, MA, United States

http://www.sciencedirect.com/science/article/pii/S0040403915000106

Factors Influencing the regioselectivity of the oxidation of asymmetric secondary amines with singlet oxygen
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http://onlinelibrary.wiley.com/doi/10.1002/chem.201500121/abstract?deniedAccessCustomisedMessage=&userIsAuthenticated=false

Electroactive and photoactive poly[Isoindigo-alt-EDOT] synthesized using direct (hetero)arylation polymerization in batch and in continuous flow
François Grenier,† Badrou Réda Aïch,†,‡ Yu-Ying Lai,§ Maxime Guérette,† Andrew B. Holmes,§ Ye Tao,‡
Wallace W. H. Wong,*,§ and Mario Leclerc*,†
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http://pubs.acs.org/doi/abs/10.1021/acs.chemmater.5b00083

Synthesis of a carprofen analogue using a continuous flow UV-reactor
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Continuous synthesis of artemisinin-derived medicines
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Consecutive oxygen-based oxidations convert amines to α-cyanoepoxides
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Continuous-flow oxidative cyanation of primary and secondary amines using singlet oxygen
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Synthesis of carbohydrate-functionalised sequence-defined oligo (amidoamine)s by photochemical thiol-ene coupling in a continuous flow reactor
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Visible light-initiated preparation of functionalized polystyrene monoliths for flow chemistry
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Continuous flow photolysis of aryl azides: preparation of 3H-azepinones
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