FACHBEREICHSTAG | 10.11.2026

Meggers Lab

MASTERING THE METALS

CRAFTING CATALYSTS FOR CHIRAL COMPOUNDS

Dr. Dominik Baran



FACHBEREICHSTAG | 10.11.2026

MEET OUR TEAM



Head of Group



Prof. Dr. Eric Meggers

Group Leader



Dr. Lilu Zhang

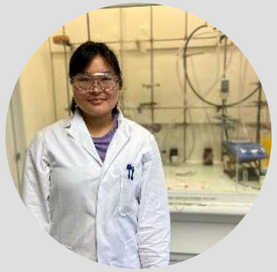
Staff Scientist



Ina Pinnschmidt

Secretary

Post-Doctoral Researchers



Dr. Erin Hanada



Dr. Basile Weyl



Dr. Dominik Baran

Master Student



Thomas Krüger

Erasmus PhD Student



Paula Romero Navarro

Lab Techs



Marcel Hemming



Nina Hoffbauer

PhD Students



Felix Möller



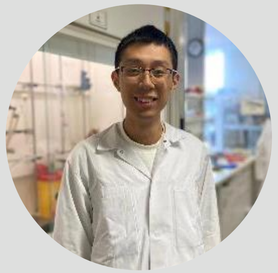
Anna Lena Opper



Finn Höeg



Lukas Hinterlang



Yuan Zheng

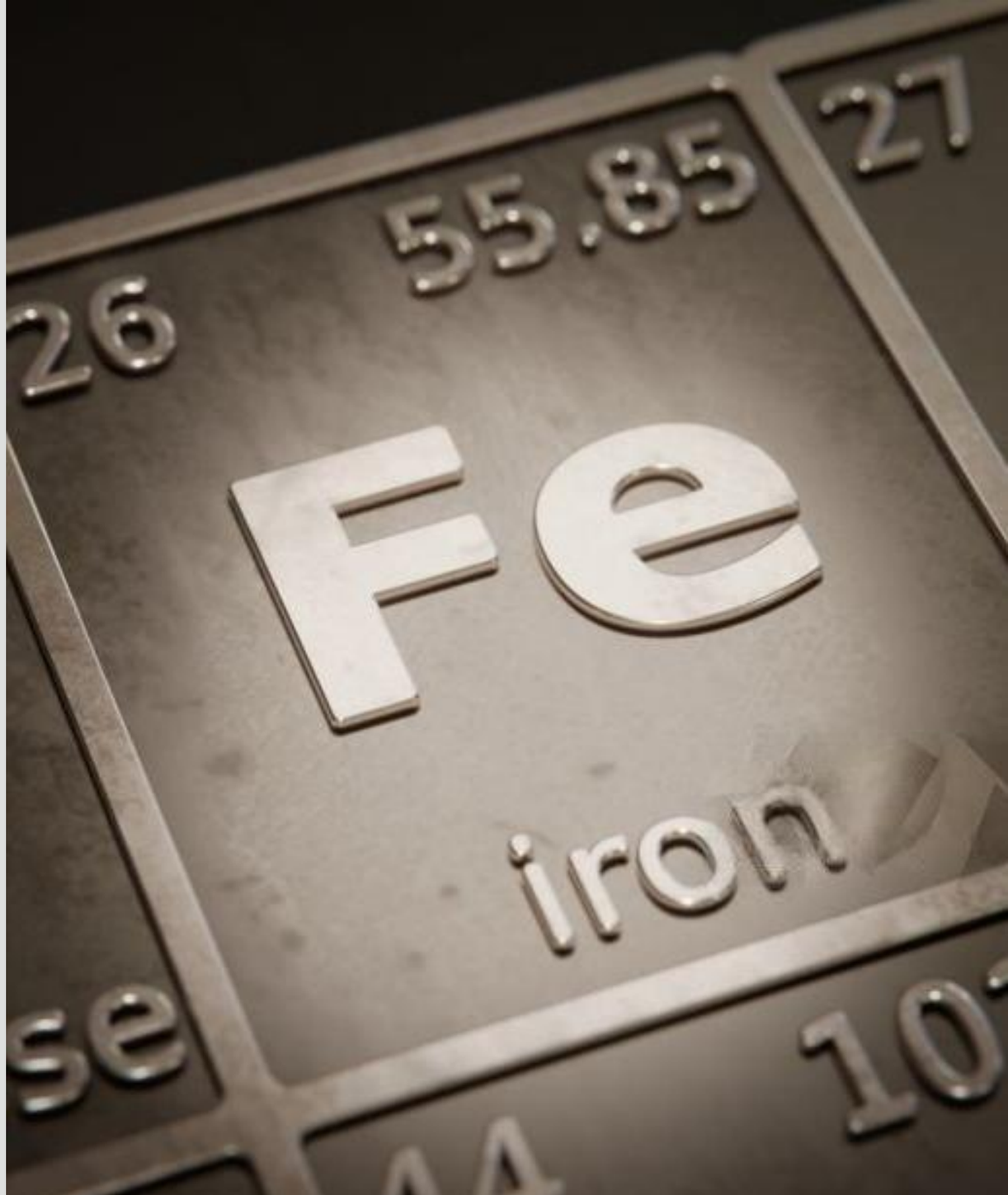


Qingliang Yang

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OUR RESEARCH

COMPLEX DESIGN I CATALYSIS



OUR PHILOSOPHY

FROM THE DRAWING BOARD TO THE FLASK



THINK

CREATIVITY

SYNTHESIS

PREPARATIVE SKILLS

ANALYSIS

ANALYTICAL SKILLS

APPLICATION

RESEARCH

OPTIMIZATION

CHOOSE YOUR METAL

THINK



25 $^6S_{5/2}$ **Mn** Manganese 54.938043(2) $[Ar]3d^5 4s^2$ 7.4340	26 $^5D_4$ **Fe** Iron 55.845(2) $[Ar]3d^6 4s^2$ 7.9025	27 $^4F_{9/2}$ **Co** Cobalt 58.933194(3) $[Ar]3d^7 4s^2$ 7.8810	28 $^3F_4$ **Ni** Nickel 58.6934(4) $[Ar]3d^8 4s^2$ 7.6399
	44 $^5F_5$ **Ru** Ruthenium 101.07(2) $[Kr]4d^7 5s$ 7.3605	45 $^4F_{9/2}$ **Rh** Rhodium 102.90549(2) $[Kr]4d^8 5s$ 7.4589	
	76 $^5D_4$ **Os** Osmium 190.23(3) $[Xe]4f^{14} 5d^6 6s^2$ 8.4382	77 $^4F_{9/2}$ **Ir** Iridium 192.217(2) $[Xe]4f^{14} 5d^7 6s^2$ 8.9670	

CHOOSE YOUR METAL

THINK



26 $^5D_4$

Fe

Iron

55.845(2)

$[Ar]3d^6 4s^2$

7.9025

- CHOOSE YOUR METAL
- COORDINATION MODE

THINK



26 $^5D_4$

Fe

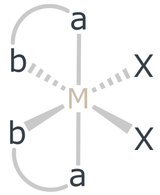
Iron

55.845(2)

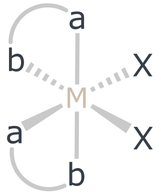
$[Ar]3d^64s^2$

7.9025

BIDENTATE

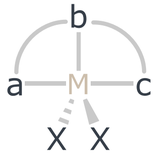


C_2-symmetry

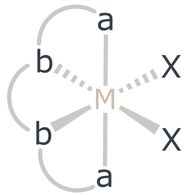


non-C_2-symmetry

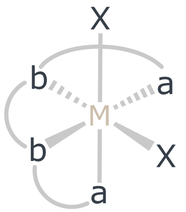
TRIDENTATE



TETRADENTATE

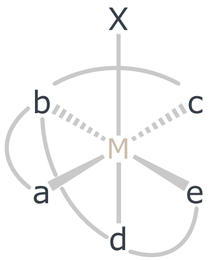


cis-α

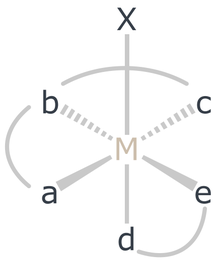


cis-β

PENTADENTATE

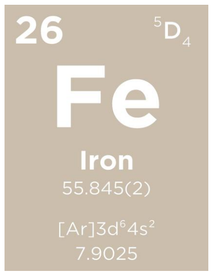


LIGAND COMBINATION

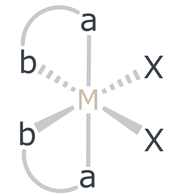


- CHOOSE YOUR METAL
- COORDINATION MODE
- CHIRAL-AT-METAL VS. STEREOGENIC-AT-METAL

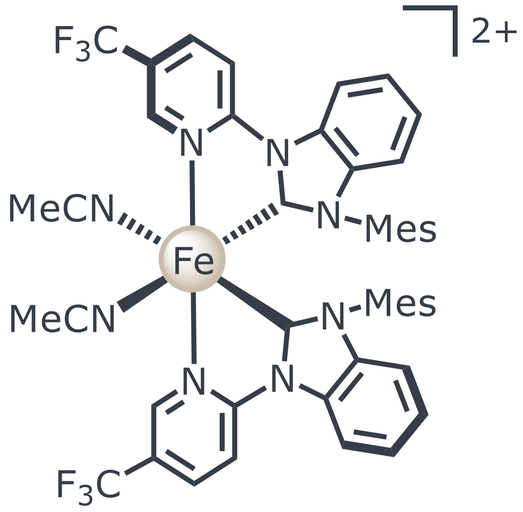
THINK



BIDENTATE



C_2-symmetry



- CHOOSE YOUR METAL
- COORDINATION MODE
- CHIRAL-AT-METAL VS. STEREOGENIC-AT-METAL

for more information ...

THINK



... visit our poster

26 $^5D_4$

Fe

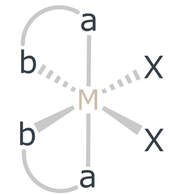
Iron

55.845(2)

$[Ar]3d^6 4s^2$

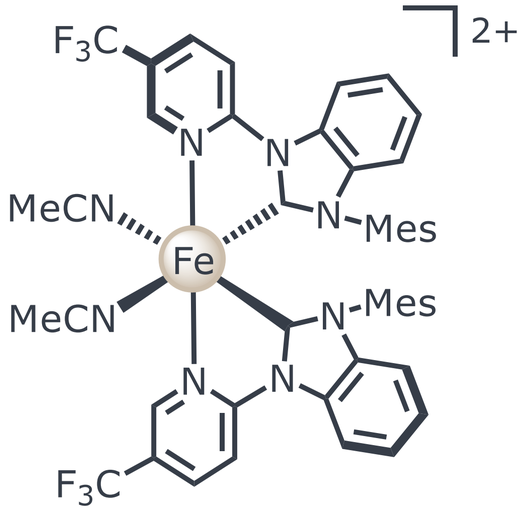
7.9025

BIDENTATE



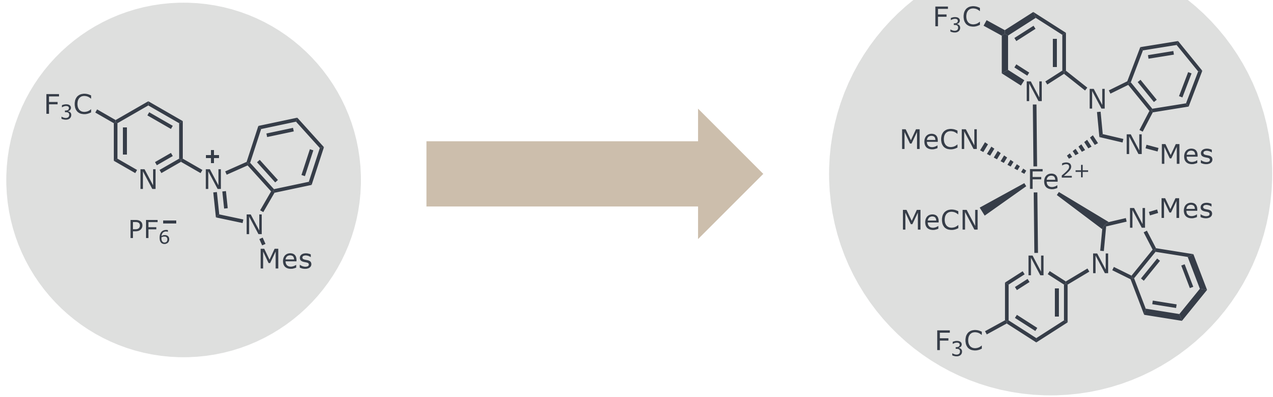
C_2-symmetry





SYNTHESIS

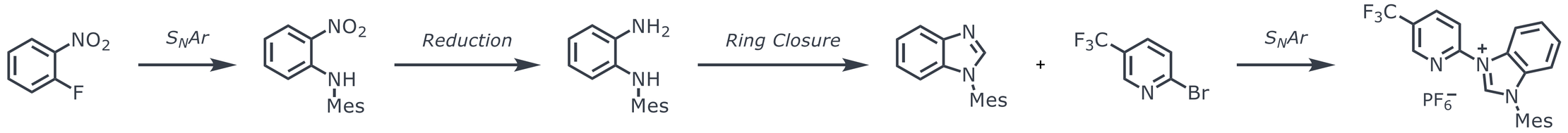
REACTION PLAN

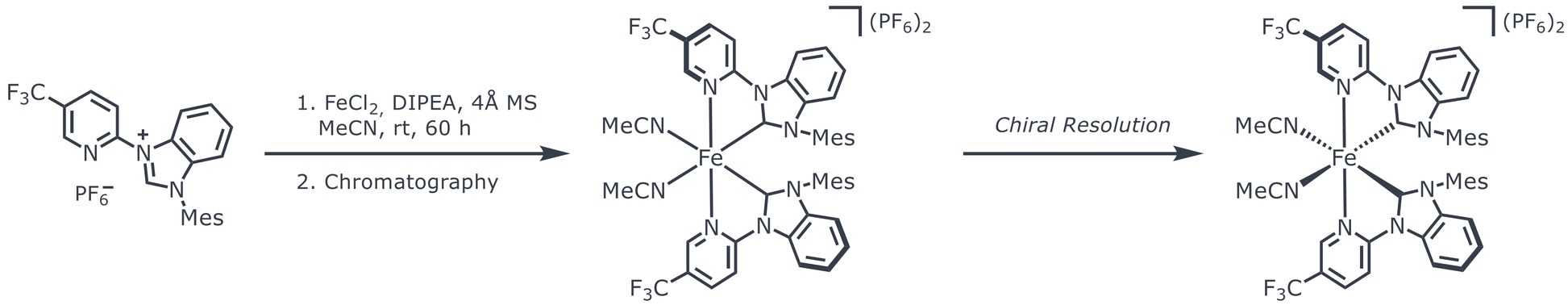


SYNTHESIS

- REACTION PLAN
- LIGAND SYNTHESIS
- COMPLEX FORMATION



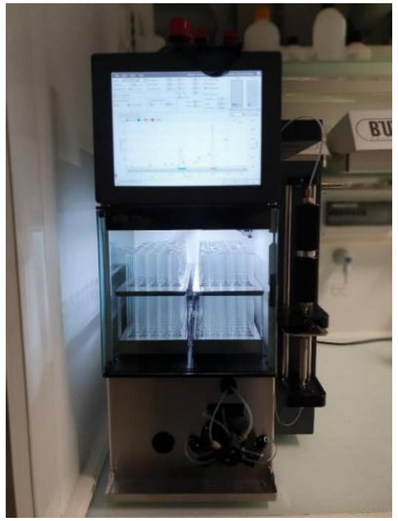




SYNTHESIS

- REACTION PLAN
- LIGAND SYNTHESIS
- COMPLEX FORMATION
- OUR EQUIPMENT

AUTOMATED CHROMATOGRAPHY



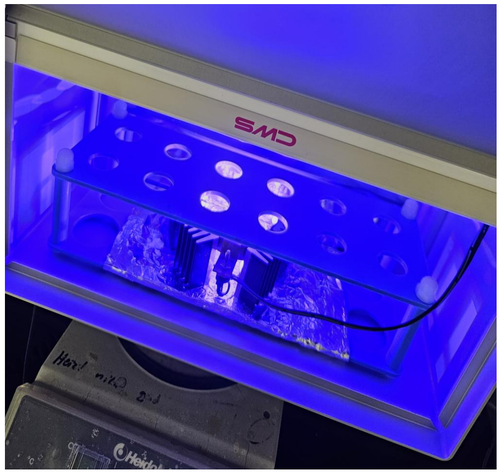
STANDARD SCHLENK TECHNIQUE



MICROWAVE-ASSISTED SYNTHESIS



PHOTOREACTOR



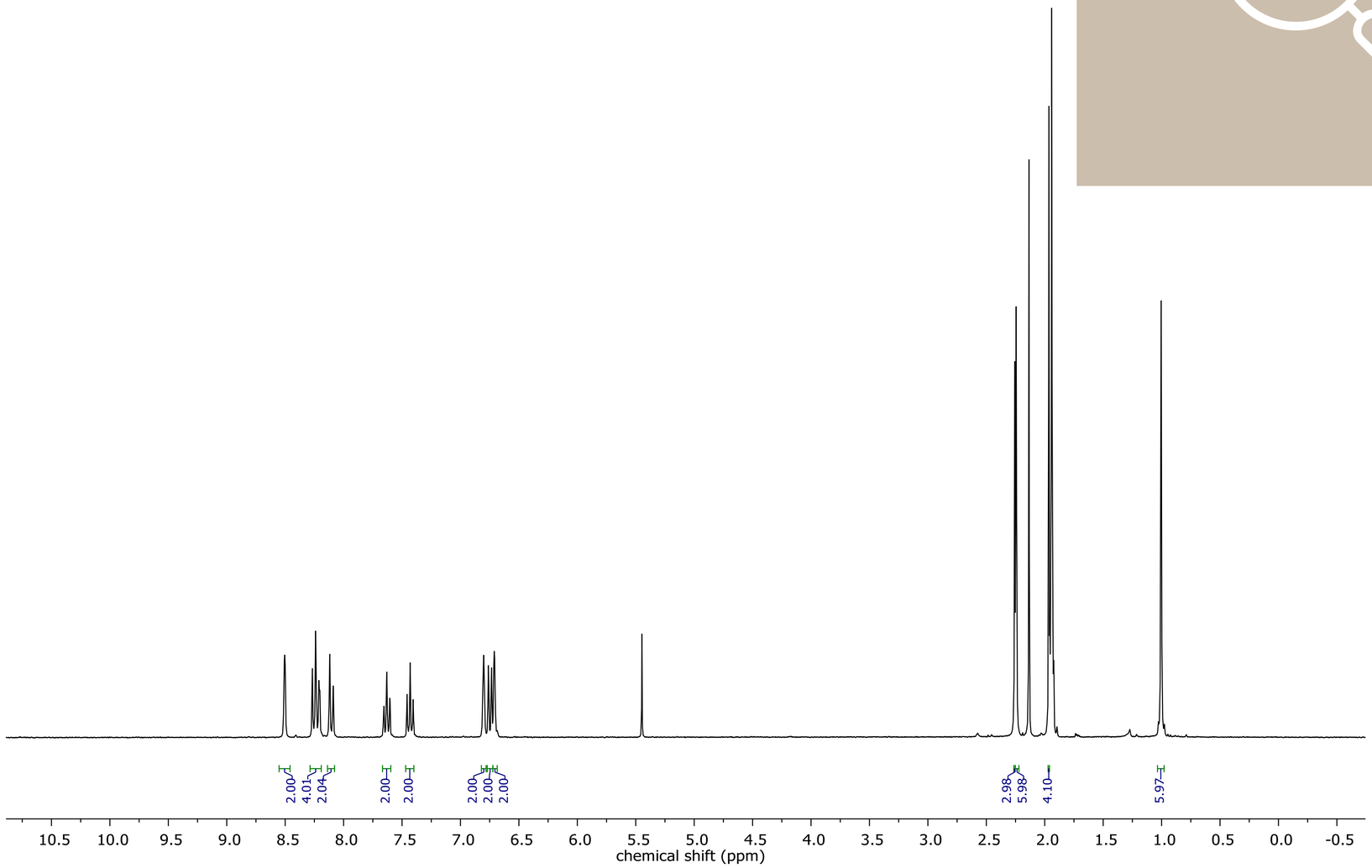
ELECTROCHEMICAL SETUP



NMR (^{1}H, ^{13}C, ^{19}F)

ANALYSIS

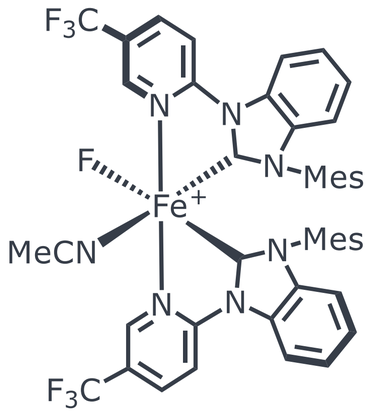


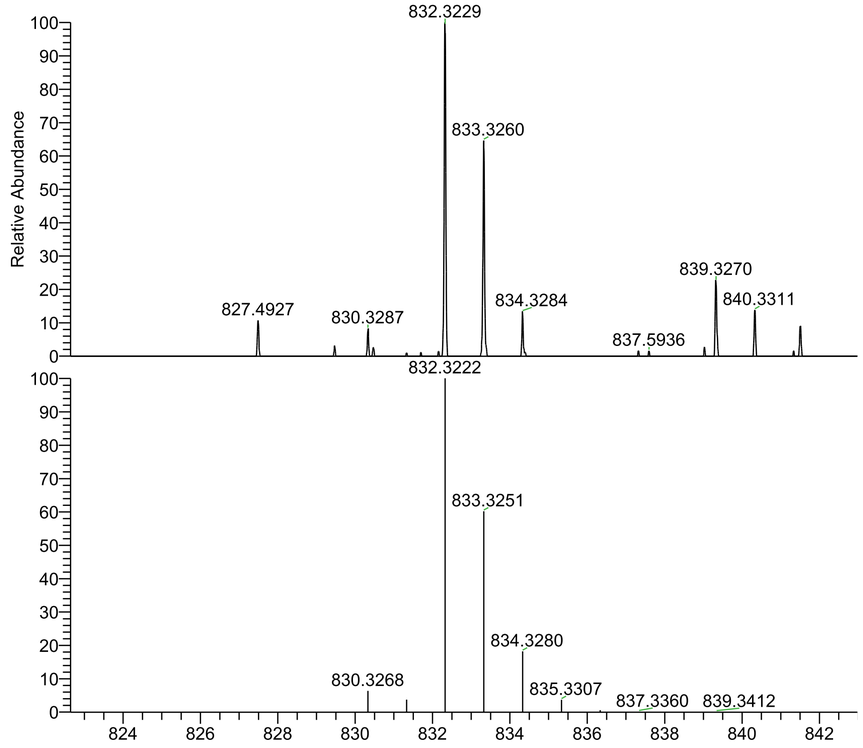


ANALYSIS

- NMR (^{1}H, ^{13}C, ^{19}F)
- HRMS

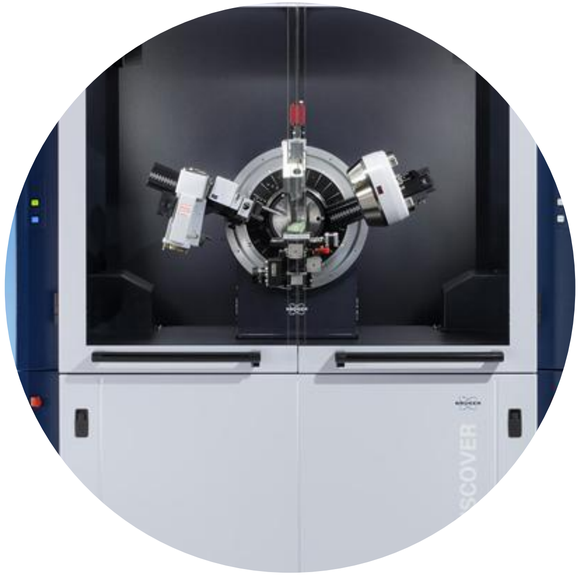


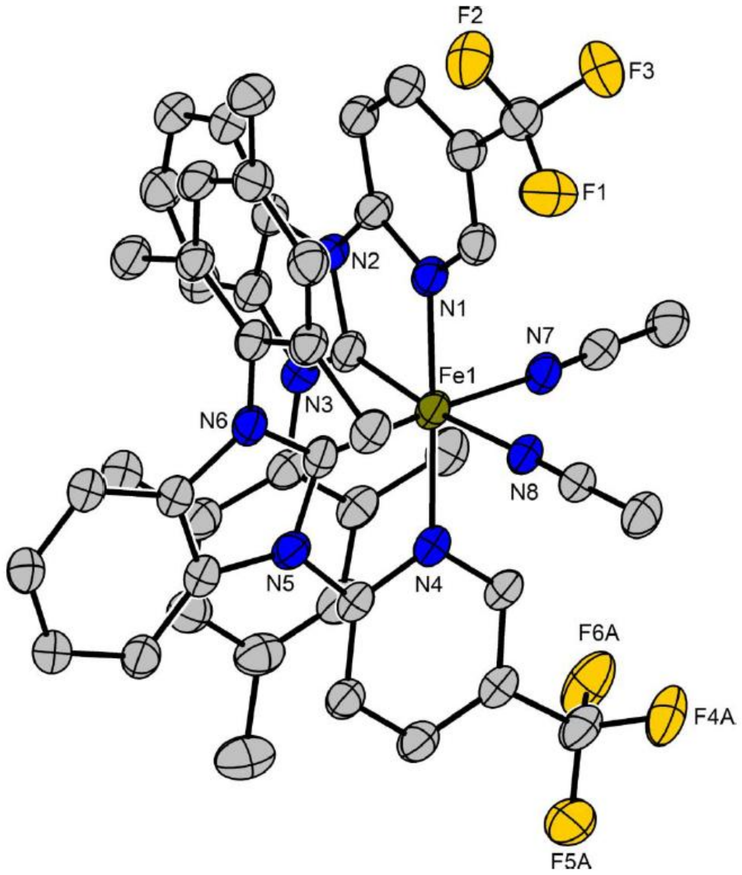




ANALYSIS

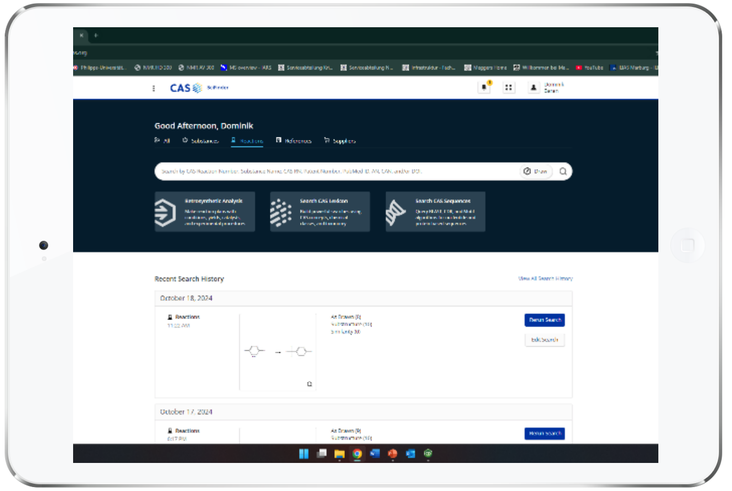
- NMR (^{1}H, ^{13}C, ^{19}F)
- HRMS
- X-RAY DIFFRACTION

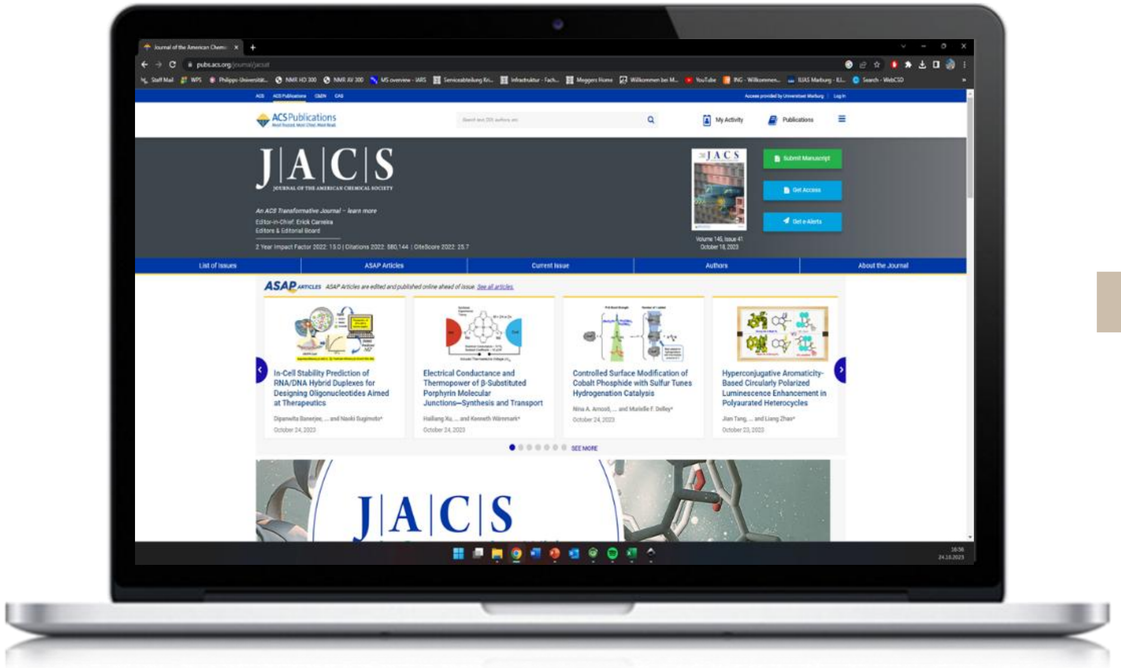


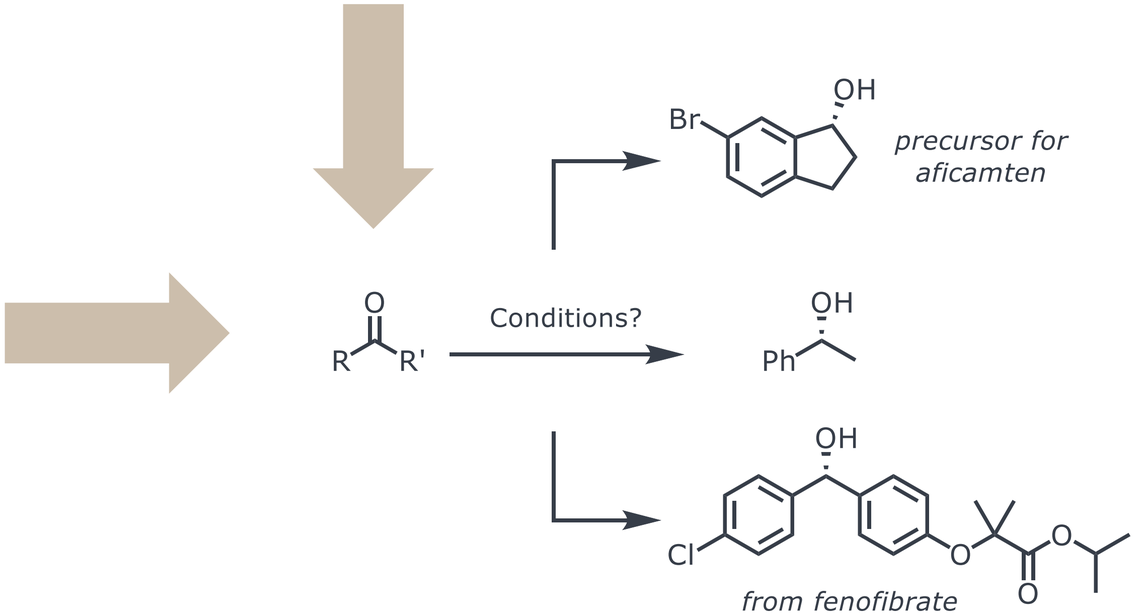


APPLICATION

- LITERATURE RESEARCH
- SCIFINDER

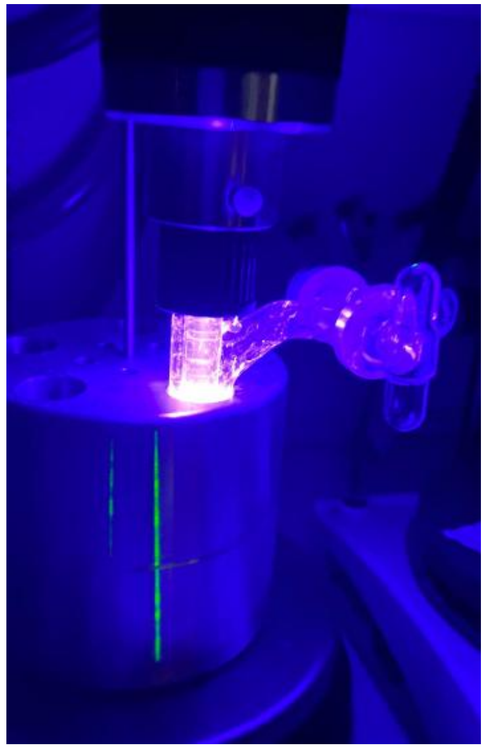


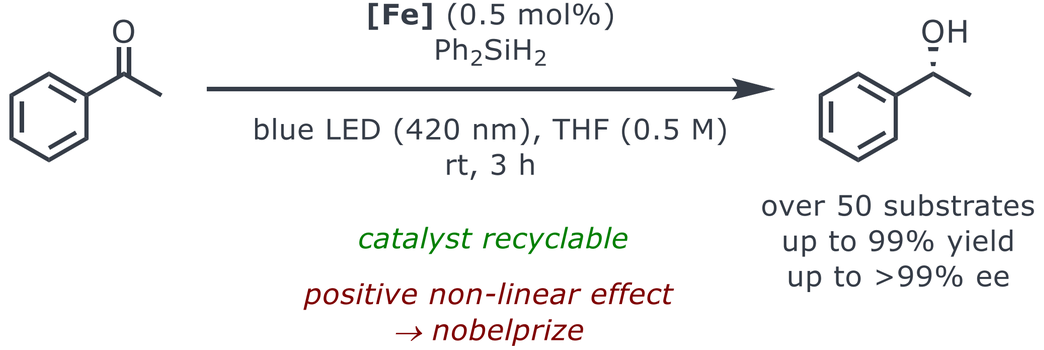


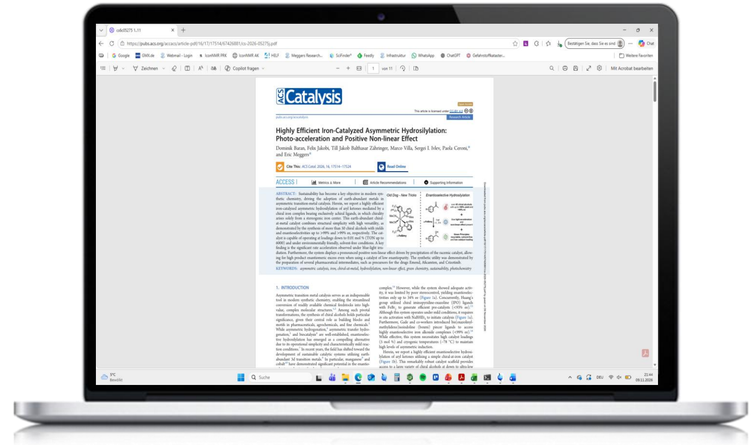


OPTIMIZATION

- TEMPERATURE
- SOLVENT
- TIME
- CONCENTRATION
- STOICHIOMETRY
- ADDITIVES





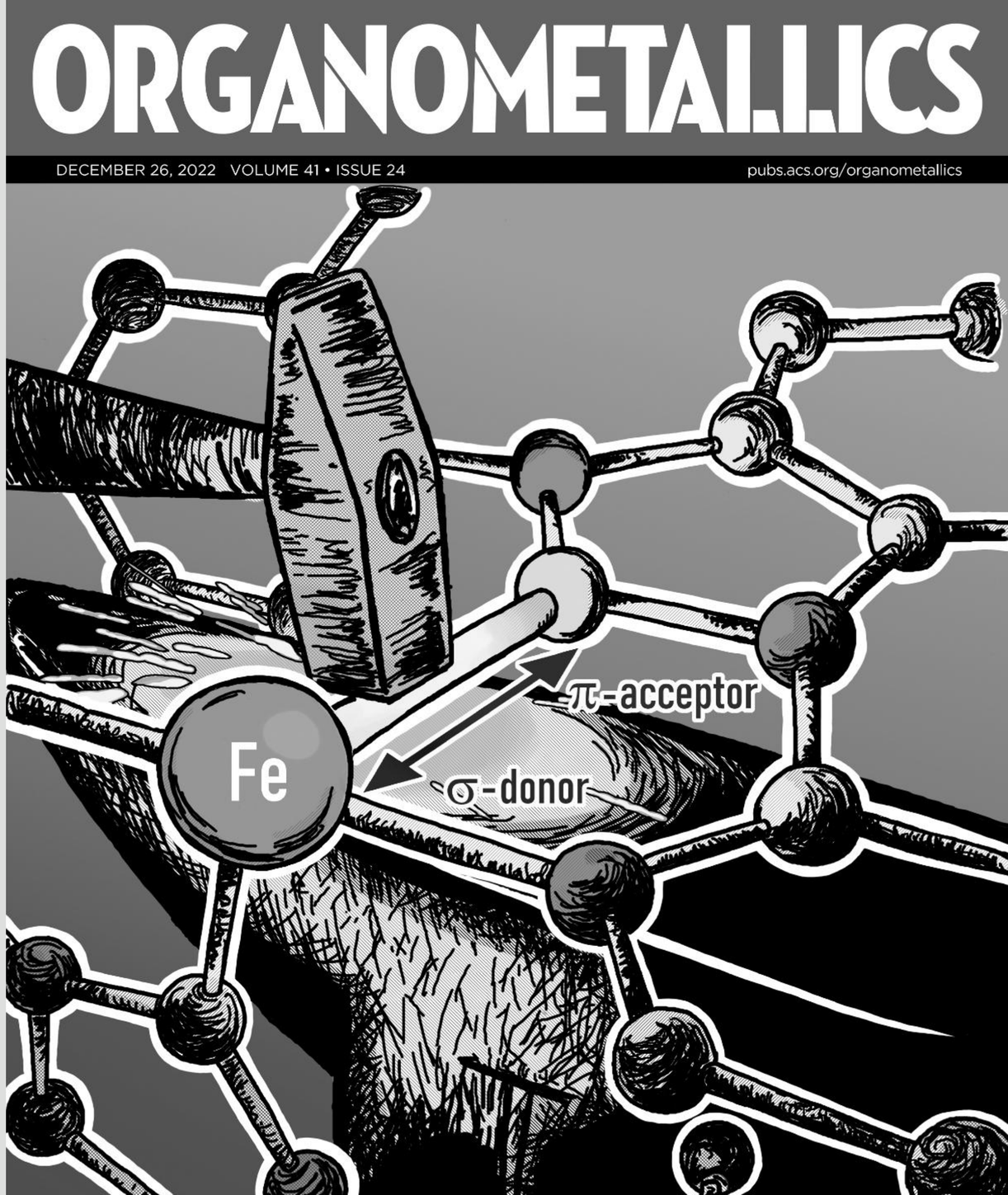


ACS Catal.
2026, *16*, 17514.

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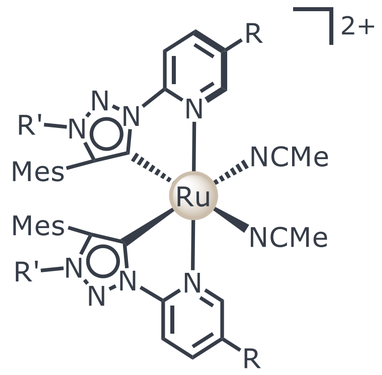
OUR HIGHLIGHTS

RUTHENIUM I IRON



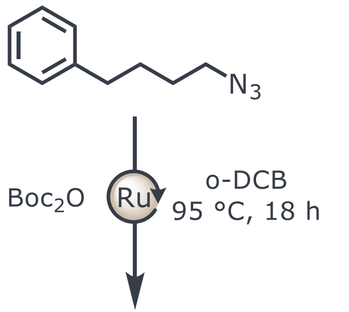
THE ALLMIGHTY

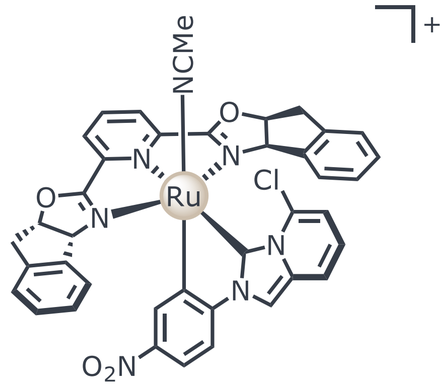
RUTHENIUM CATALYSTS



Chiral Pyrrolidines

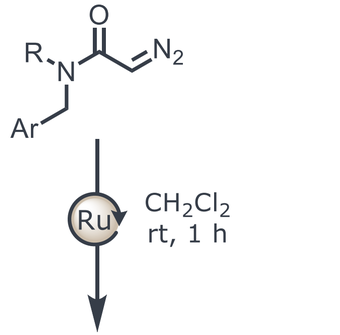
Chem. Eur. J. **2025**, *31*, e202500076.

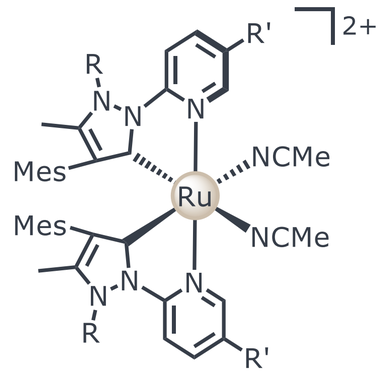




Chiral β-Lactams

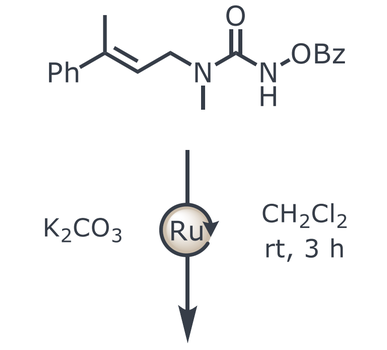
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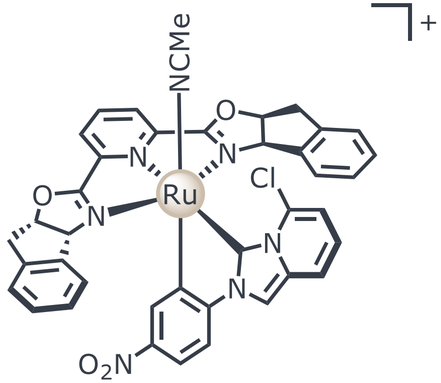
Chiral Aziridine

Chem. Eur. J. **2026**, *32*, e71426.



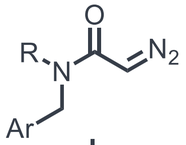
THE ALLMIGHTY

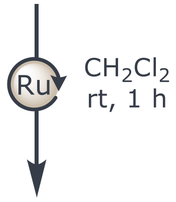
RUTHENIUM CATALYSTS

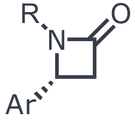


Chiral β-Lactams

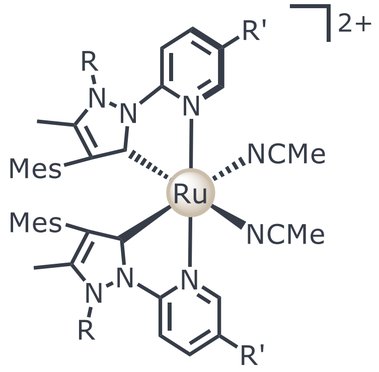
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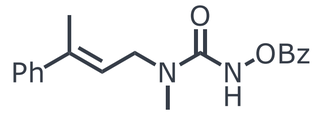


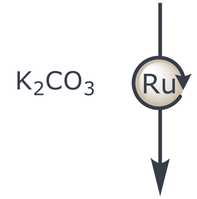
13 examples
up to 82% yield
up to 98% ee

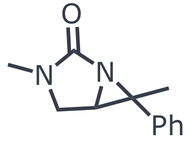


Chiral Aziridine

Chem. Eur. J. **2026**, *32*, e71426.

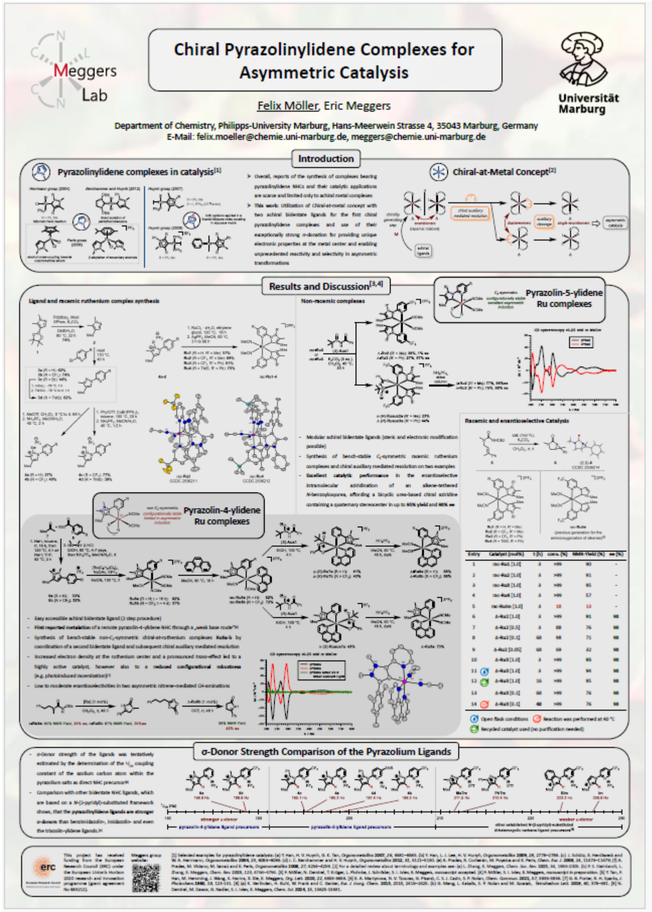






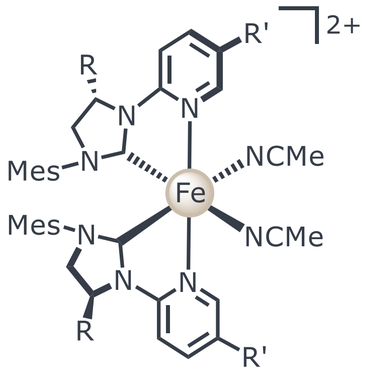
95% yield
up to 98% ee

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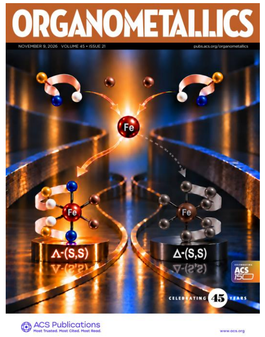
THE NEWCOMER

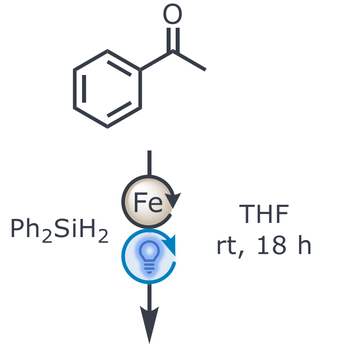
IRON CATALYSTS

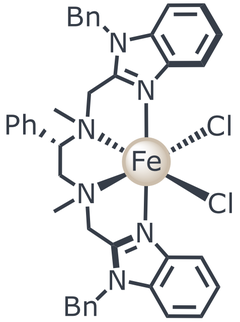


Chiral Alcohols

Organometallics 2026, *45*, 2609.

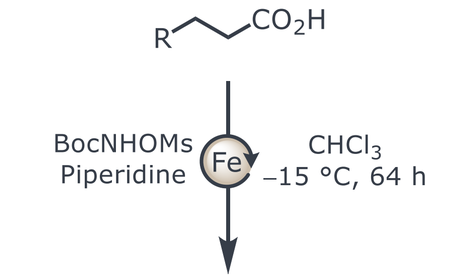


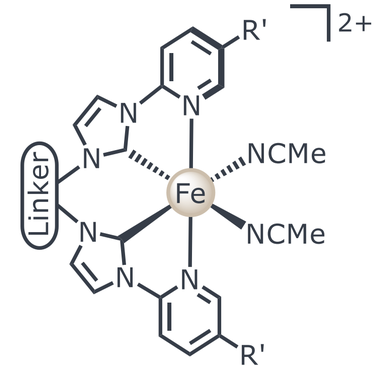




Chiral α,β–Diamino Acids

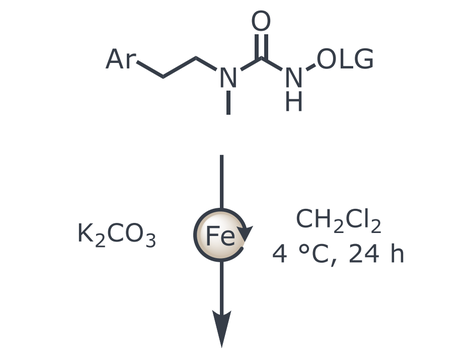
Ang. Chem. Int. Ed. 2026, *65*, e4041858.





Chiral 2-Imidazolidinones

Organometallics 2026, *45*, 1428.

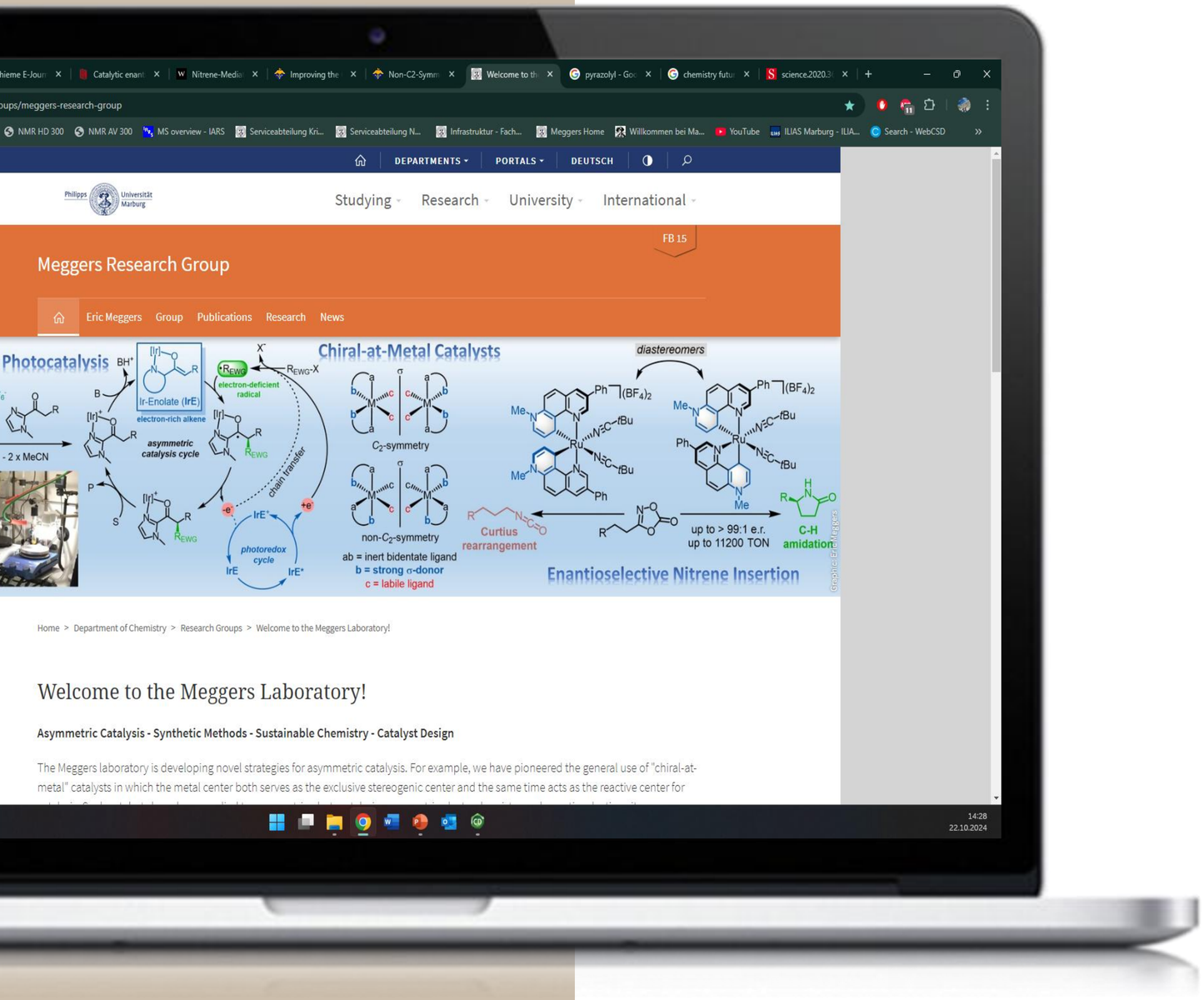


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Questions left? Feel free to ask!

