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## 1. General experimental methods.

Melting points were determined in unsealed capillary tubes. IR spectra were obtained in film over NaCl pellets. NMR spectra were recorded at 20-25 °C, at 300 MHz for <sup>1</sup>H and 75.5 MHz for <sup>13</sup>C in CDCl<sub>3</sub> solutions, unless otherwise stated. Assignments of individual <sup>13</sup>C and <sup>1</sup>H resonances are supported by DEPT experiments and 2D correlation experiments (COSY, HSQCed or HMBC). Mass spectra were recorded under under chemical ionization (CI) at 230 eV. Exact mass was obtained using a TOF detector. TLC was carried out with 0.2 mm thick silica gel plates. Visualization was accomplished by UV light. Flash column chromatography was performed on silica gel (230-400 mesh) or on alumina (70-230 mesh). Chiral stationary phase HPLC was performed using a Chiralcel OD column (0.46 cm × 25 cm). Optical rotation was measured at 20 °C with a sodium lamp at 589 nm and a path length of 1 dm. All solvents used in reactions were anhydrous and purified according to standard procedures. All air- or moisture-sensitive reactions were performed under argon; the glassware was dried (130 °C) and purged with argon. Racemic samples of **2a-d** were prepared according the procedure previously described.<sup>1</sup> A racemic sample of **2e** was prepared by the same procedure (see below). Phosphoramides **4a-d** were prepared according to literature procedures.<sup>2</sup> Phosphoric acid **5e** was used from commercial source (Aldrich, 98%).

## 2. Synthesis of racemic 2,3-dimethoxy-12b-(1*H*-pyrrol-2-yl)-5,12b-dihydroisoindolo[1,2-*a*]isoquinolin-8(6*H*)-one (**2e**).

TiCl<sub>4</sub> (0.14 mL, 1.4 mmol) was added dropwise to a solution of 12b-hydroxyisoindoloisoquinolone **1**<sup>3</sup> (160 mg, 0.52 mmol) and pyrrole **3e** (0.03 mL, 0.52 mmol) in dry CH<sub>2</sub>Cl<sub>2</sub> (10 mL) at -78 °C. After 2 h stirring, NH<sub>4</sub>Cl (saturated aqueous solution, 2 mL) was added, and the reaction mixture was allowed to warm up to room temperature. The organic layer was separated and the aqueous phase was extracted with CH<sub>2</sub>Cl<sub>2</sub> (3 × 15 mL). The combined organic extracts were dried (Na<sub>2</sub>SO<sub>4</sub>) and concentrated *in vacuo*. The

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<sup>1</sup> Aranzamendi, E.; Sotomayor, N.; Lete, E. Bronsted acid catalyzed enantioselective alpha-amidoalkylation in the synthesis of isoindoloisoquinolines. *J. Org. Chem.* **2012**, *77*, 2986-91.

<sup>2</sup> Nakashima, D.; Yamamoto, H. Design of chiral *N*-triflyl phosphoramidate as a strong chiral Bronsted acid and its application to asymmetric Diels-Alder reaction. *J. Am. Chem. Soc.* **2006**, *128*, 9626-7.

<sup>3</sup> Collado, M. I.; Manteca, I.; Sotomayor, N.; Villa, M. J.; Lete, E. Metalation vs Nucleophilic Addition in the Reactions of *N*-Phenethylimides with Organolithium Reagents. Ready Access to Isoquinoline Derivatives *via N*-Acyliminium Ions and Parham-Type Cyclizations. *J. Org. Chem.* **1997**, *62*, 2080-92.

crude mixture was purified by column chromatography (silica gel, hexane/ethyl acetate, 6:4) to obtain isoindoloisoquinoline **2e** (138 mg, 76%).

### 3. Synthesis of enantioenriched isoindolo[1,2-*a*]isoquinolines **2a-d**.

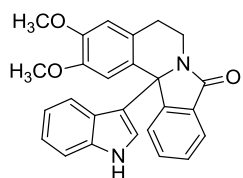
**(R)-12b-(1H-indol-3-yl)-2,3-dimethoxy-5,6-dihydroisoindolo[1,2-*a*]isoquinolin-8(12bH)-one (2a) (Table 8, entry 1).** According to the Typical Procedure, **1** (62 mg, 0.20 mmol) was treated with indole **3a** (24 mg, 0.20 mmol) and **4a** (29.2 mg, 0.04 mmol, 20 mol %) in dry THF (5 mL) for 24h at rt, to afford isoindolo[1,2-*a*]isoquinoline **2a** (71 mg, 90 %), whose spectroscopic data are coincidental to those reported.<sup>1</sup> The enantiomeric excess was determined by HPLC to be 93% [Chiralcel OD, 15 % hexane : 2-propanol, 1 mL/min,  $t_r$  (S)= 26.32 min (3.48 %),  $t_r$  (R)= 30.23 min (96.52 %)]. <sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>):  $\delta$  2.72-2.77 (m, 1H), 3.14-3.22 (m, 2H), 3.85 (s, 3H), 3.88 (s, 3H), 4.37-4.41 (m, 1H), 6.40 (d,  $J$  = 8.1 Hz, 1H), 6.67 (s, 1H), 6.75 (d,  $J$  = 2.6 Hz, 1H), 6.79 (t,  $J$  = 7.6 Hz, 1H), 7.08 (t,  $J$  = 7.3 Hz, 1H), 7.25 (s, 1H), 7.31 (d,  $J$  = 8.2 Hz, 1H), 7.51-7.54 (m, 2H), 7.64-7.67 (m, 1H), 7.97-8.01 (m, 1H), 8.31 (broad s, 1H) ppm; <sup>13</sup>C{<sup>1</sup>H} NMR (75.5 MHz, CDCl<sub>3</sub>):  $\delta$  29.7, 34.9, 55.9, 56.2, 66.1, 110.9, 111.2, 111.8, 117.7, 119.8, 120.0, 122.4, 123.9, 124.0, 124.9, 126.5, 127.3, 128.6, 129.5, 131.88, 132.0, 136.9, 147.0, 148.5, 149.8, 167.2 ppm.

**(R)-2,3-dimethoxy-12b-(5-nitro-1H-indol-3-yl)-5,6-dihydroisoindolo[1,2-*a*]isoquinolin-8(12bH)-one (2b) (Table 8, entry 5).** According to the Typical Procedure, **1** (62 mg, 0.20 mmol) was treated with indole **3b** (32 mg, 0.20 mmol) and **4a** (29.2 mg, 0.04 mmol, 20 mol %) in dry THF (5 mL) for 24h at rt to afford isoindolo[1,2-*a*]isoquinoline **2b** (83 mg, 94%), whose spectroscopic data are coincidental to those reported.<sup>1</sup> The enantiomeric excess was determined by HPLC to be 11% [Chiralcel OD, 15 % hexane : 2-propanol, 1 mL/min,  $t_r$  (S)= 44.46 min (44.37 %),  $t_r$  (R)= 57.18 min (55.63 %)]. <sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>):  $\delta$  2.76-2.78 (m, 1H), 3.13-3.22 (m, 2H), 3.85 (s, 3H), 3.89 (s, 3H), 4.43-4.46 (m, 1H), 6.59 (s, 1H), 6.93 (d,  $J$  = 2.0 Hz, 1H), 7.22 (s, 1H), 7.25 (d,  $J$  = 2.0 Hz, 1H), 7.35 (d,  $J$  = 9 Hz, 1H), 7.56-7.65 (m, 2H), 7.71-7.72 (m, 1H), 8.01 (d,  $J$  = 9.0 Hz, 1H), 8.10-8.04 (m, 1H), 8.9 (broad s, 1H) ppm; <sup>13</sup>C{<sup>1</sup>H} NMR (75.5 MHz, DMSO-*d*<sub>6</sub>):  $\delta$  28.6, 34.9, 55.9, 56.4, 65.6, 111.7, 112.7, 113.0, 115.8, 117.2, 118.9, 123.5, 124.1, 125.3, 127.1, 128.8, 129.5, 131.4, 131.7, 133.1, 140.7, 140.8, 147.5, 148.8, 150.0, 166.5 ppm.

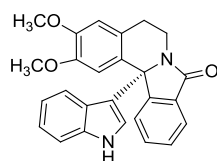
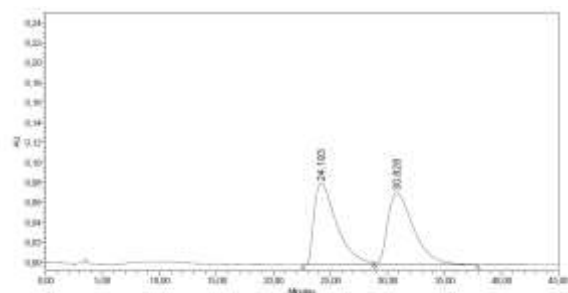
**(R)-12b-(5-bromo-1H-indol-3-yl)-2,3-dimethoxy-5,6-dihydroisoindolo[1,2-a]isoquinolin-8(12bH)-one (2c)** (Table 8, entry 6). According to the Typical Procedure, **1** (62 mg, 0.2 mmol) was treated with indole **3c** (39 mg, 0.2 mmol) and **4a** (29.2 mg, 0.04 mmol, 20 mol %) in dry THF (5 mL) for 24h at rt to afford isoindolo[1,2-a]isoquinoline **2b** (94 mg, quant.%), whose spectroscopic data are coincidental to those reported.<sup>1</sup> The enantiomeric excess was determined by HPLC to be 67% [Chiralcel OD, 15 % hexane : 2-propanol, 1 mL/min,  $t_r$  (*S*)= 24.80 min (18.42 %),  $t_r$  (*R*)= 32.92 min (83.58 %)]. <sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>):  $\delta$  2.70-2.90 (m, 1H), 3.09-3.24 (m, 2H), 3.84 (s, 3H), 3.87 (s, 3H), 4.34-4.43 (m, 1H), 6.45 (s, 1H), 6.66 (s, 1H), 6.77 (d,  $J$  = 2.5 Hz, 1H), 7.14-7.22 (m, 3H), 7.54-7.57 (m, 2H), 7.62-7.65 (m, 1H), 7.98-8.01 (m, 1H), 8.49 (broad s, 1H) ppm; <sup>13</sup>C{<sup>1</sup>H} NMR (75.5 MHz, CDCl<sub>3</sub>):  $\delta$  28.6, 34.9, 55.97, 56.2, 65.8, 111.6, 111.8, 112.8, 113.4, 117.5, 122.3, 123.9, 124.0, 125.4, 126.5, 127.3, 127.7, 128.9, 129.2, 131.8, 132.1, 135.7, 147.1, 148.6, 149.4, 167.3 ppm.

**(R)-2,3-dimethoxy-12b-(5-methoxy-1H-indol-3-yl)-5,6-dihydroisoindolo[1,2-a]isoquinolin-8(12bH)-one (2d)** (Table 8, entry 7). According to the Typical Procedure, **1** (62 mg, 0.2 mmol) was treated with indole **3d** (29 mg, 0.2 mmol) and **4a** (29.2 mg, 0.04 mmol, 20 mol %) in dry THF (5 mL) for 24h at rt to afford isoindolo[1,2-a]isoquinoline **2b** (85 mg, quant.%), whose spectroscopic data are coincidental to those reported.<sup>1</sup> The enantiomeric excess was determined by HPLC to be 52% [Chiralcel OD, 15 % hexane : 2-propanol, 1 mL/min,  $t_r$  (*S*)= 25.34 min (23.82 %),  $t_r$  (*R*)= 34.11 min (76.18 %)]. <sup>1</sup>H NMR (300 MHz, CDCl<sub>3</sub>):  $\delta$  2.73-2.82 (m, 1H), 3.09-3.28 (m, 2H), 3.41 (s, 3H), 3.84 (s, 3H), 3.87 (s, 3H), 4.38-4.44 (m, 1H), 5.71-5.72 (m, 1H), 6.57 (s, 1H), 6.71-6.74 (m, 2H), 7.18 (d,  $J$  = 8.8 Hz, 1H), 7.26 (s, 1H), 7.50-7.59 (m, 2H), 7.69-7.71 (m, 1H), 7.98-8.01 (m, 1H), 8.32 (broad s, 1H) ppm; <sup>13</sup>C{<sup>1</sup>H} NMR (75.5 MHz, CDCl<sub>3</sub>):  $\delta$  28.9, 35.8, 55.2, 55.9, 56.2, 66.3, 101.1, 110.9, 111.7, 112.1, 112.7, 117.0, 123.7, 124.3, 125.3, 127.2, 127.3, 128.6, 129.5, 131.9, 132.0, 132.2, 147.1, 148.5, 149.9, 153.8, 167.1 ppm.

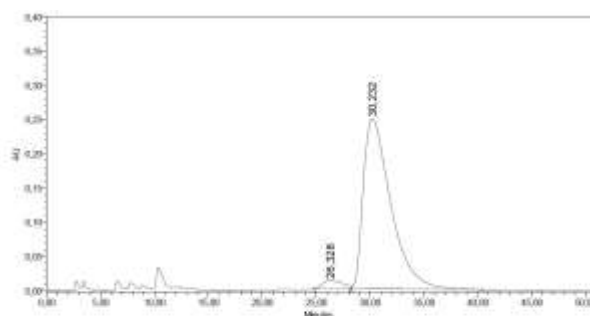
#### 4. HPLC chromatograms of racemic and selected enantioenriched 2a-e



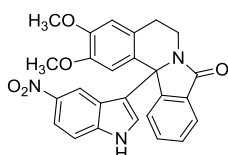
**2a**, racemic mixture



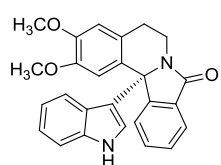
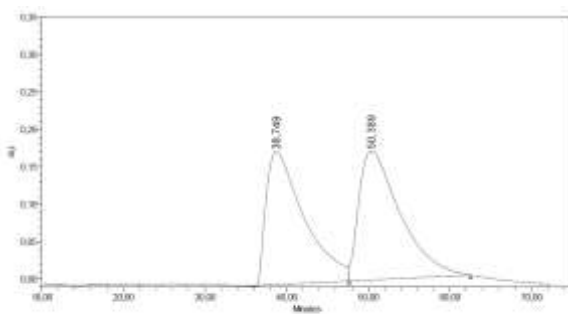
**(R)-2a**, 93 % *ee*,  
Table 8, entry 1



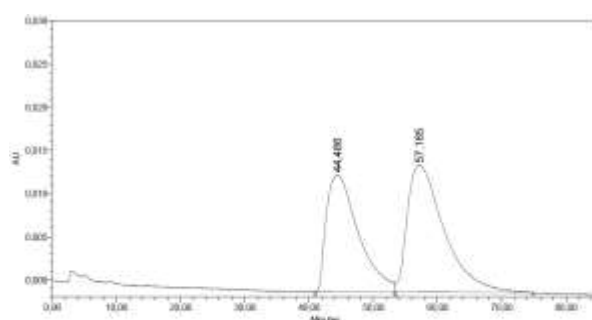
RT	Area	% Area	Height
1	26.328	1502410	3.48
2	30.232	44140254	38.52



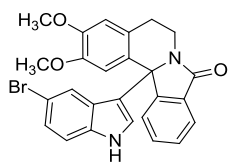
**2b**, racemic mixture



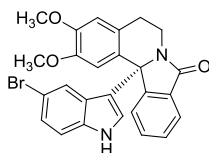
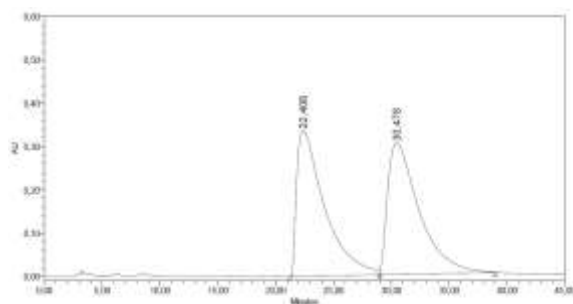
**(R)-2b**, 11 % *ee*,  
Table 8, entry 5



RT	Area	% Area	Height
1	44.286	4691623	44.37
2	57.185	5881437	55.85

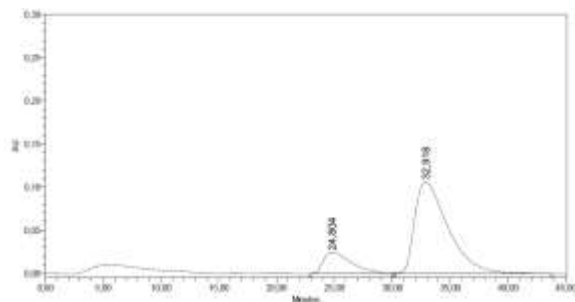


**2c**, racemic mixture

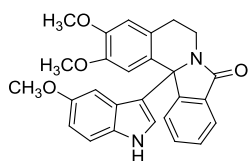


**(R)-2c**, 67% *ee*,

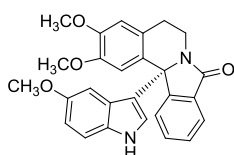
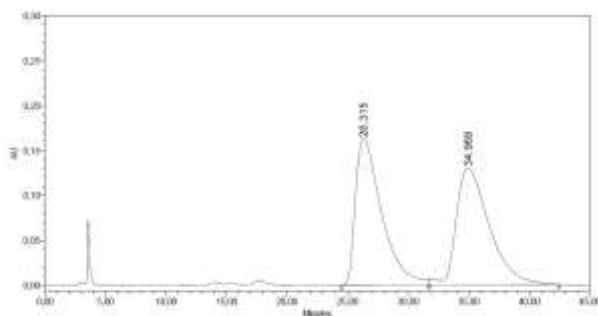
Table 8, entry 6



RT	Area	% Area	Height
1 24.004	4237253	16.42	25181
2 32.918	21574702	83.58	107003

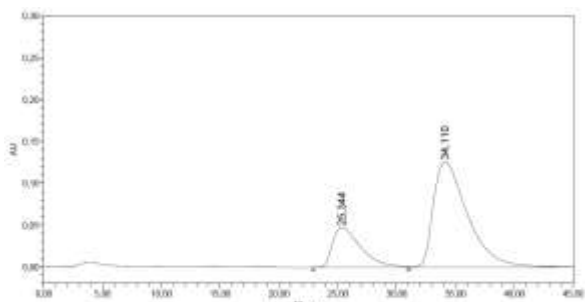


**2d**, racemic mixture

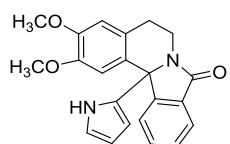


**(R)-2d**, 52 % *ee*,

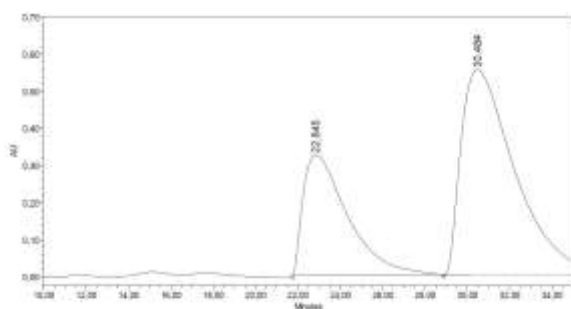
Table 8, entry 7

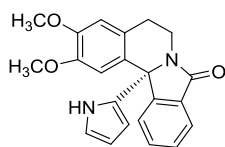


RT	Area	% Area	Height
1 25.344	5063197	23.82	47922
2 34.110	25723432	76.18	128958

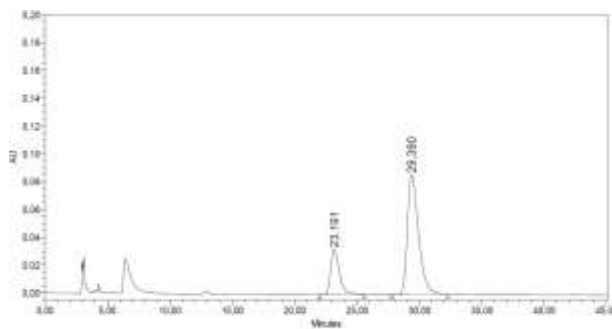


**2e**, racemic mixture

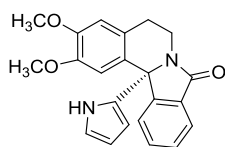




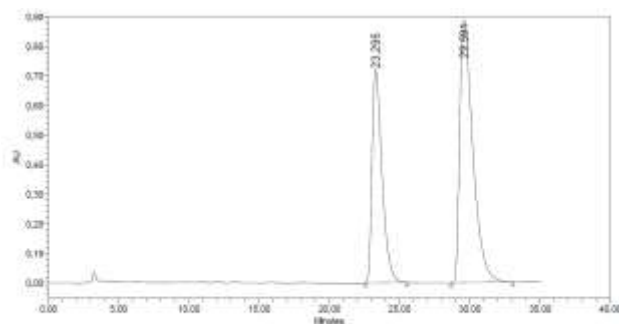
**(R)-2e**, 54 % *ee*,  
Table 8, entry 7



RT	Area	% Area	Height
1 23.191	1569316	22.87	32404
2 29.360	5293577	77.13	85889

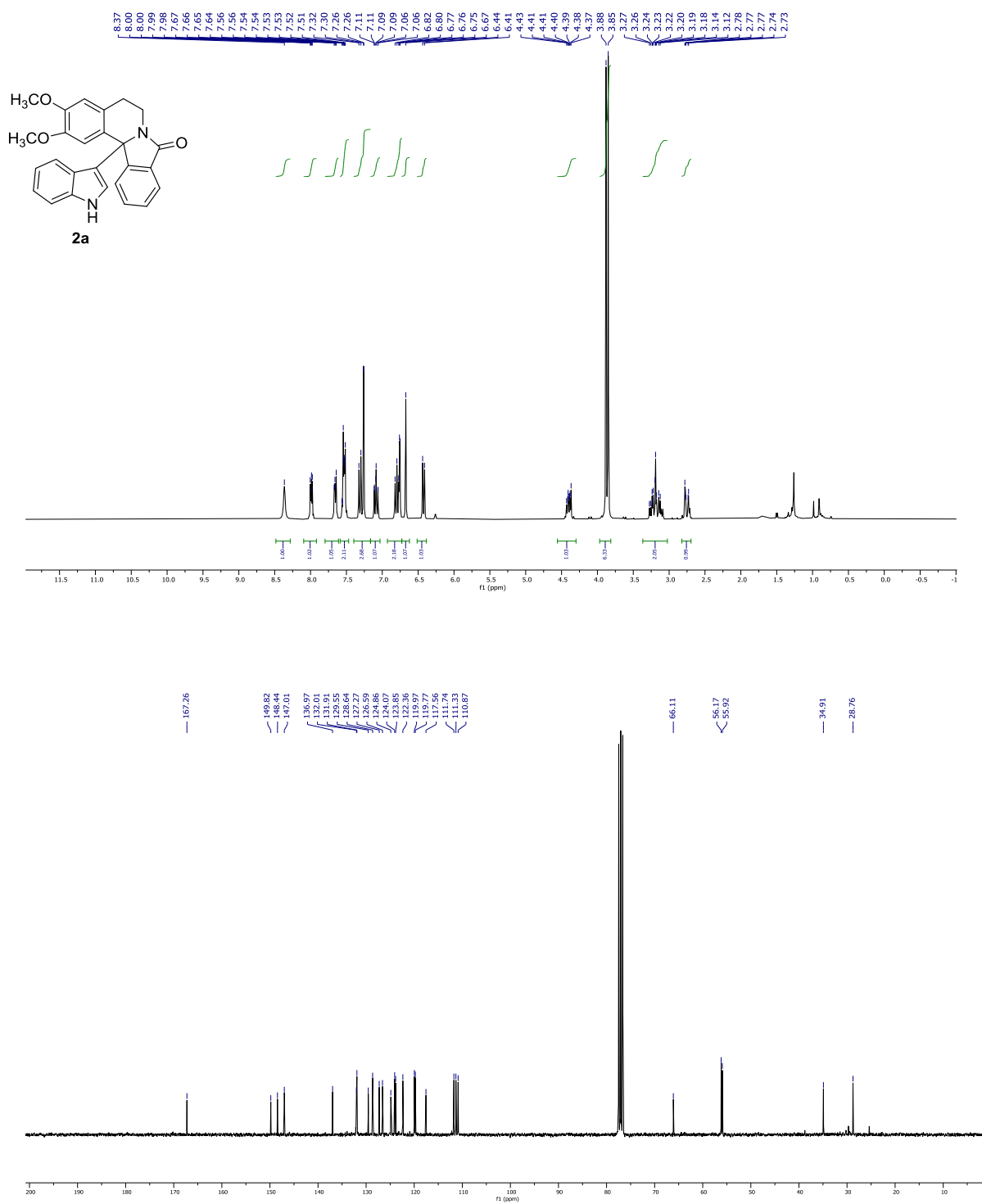


**(R)-2e**, 24 % *ee*,  
Table 8, entry 15

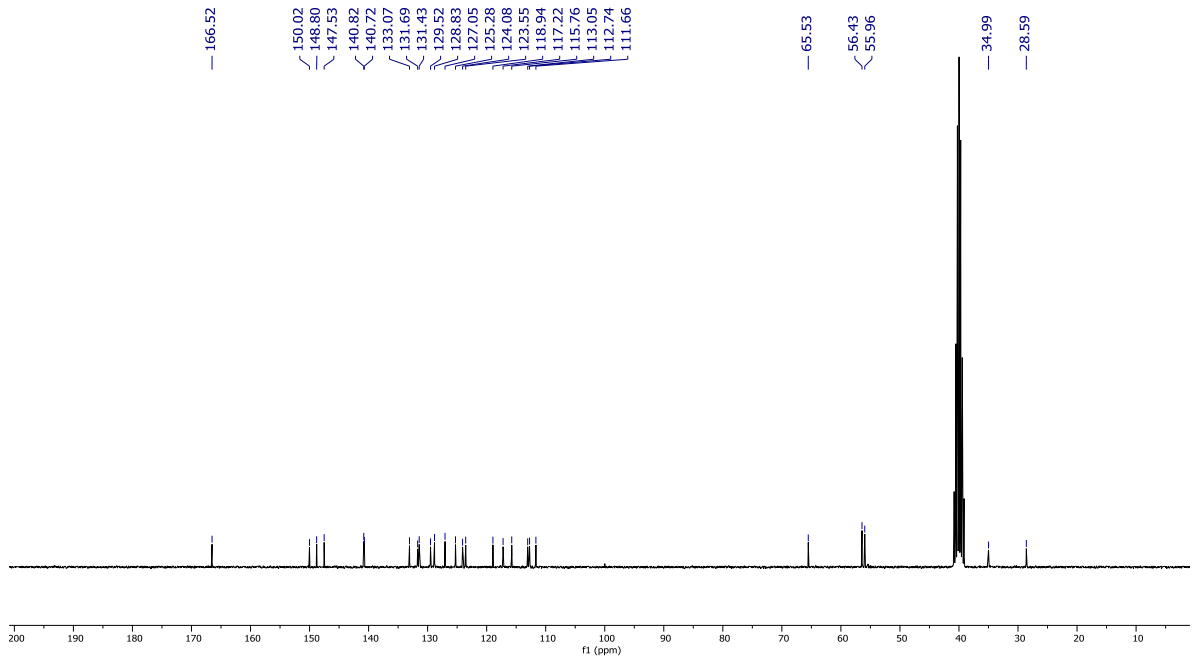
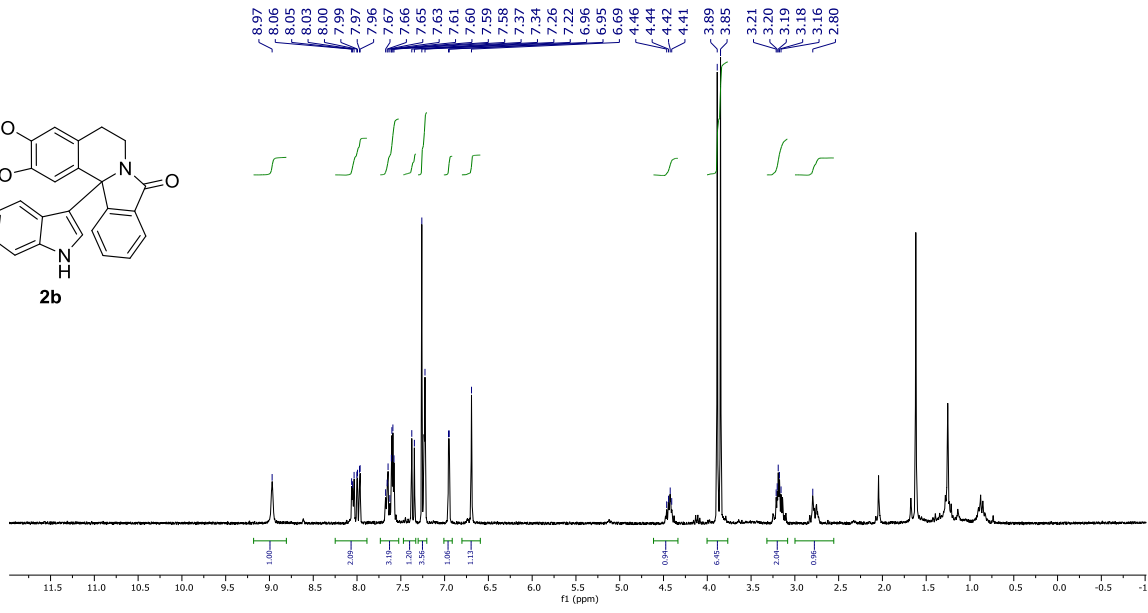
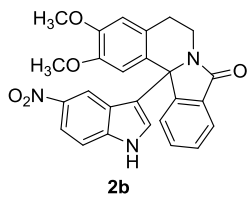


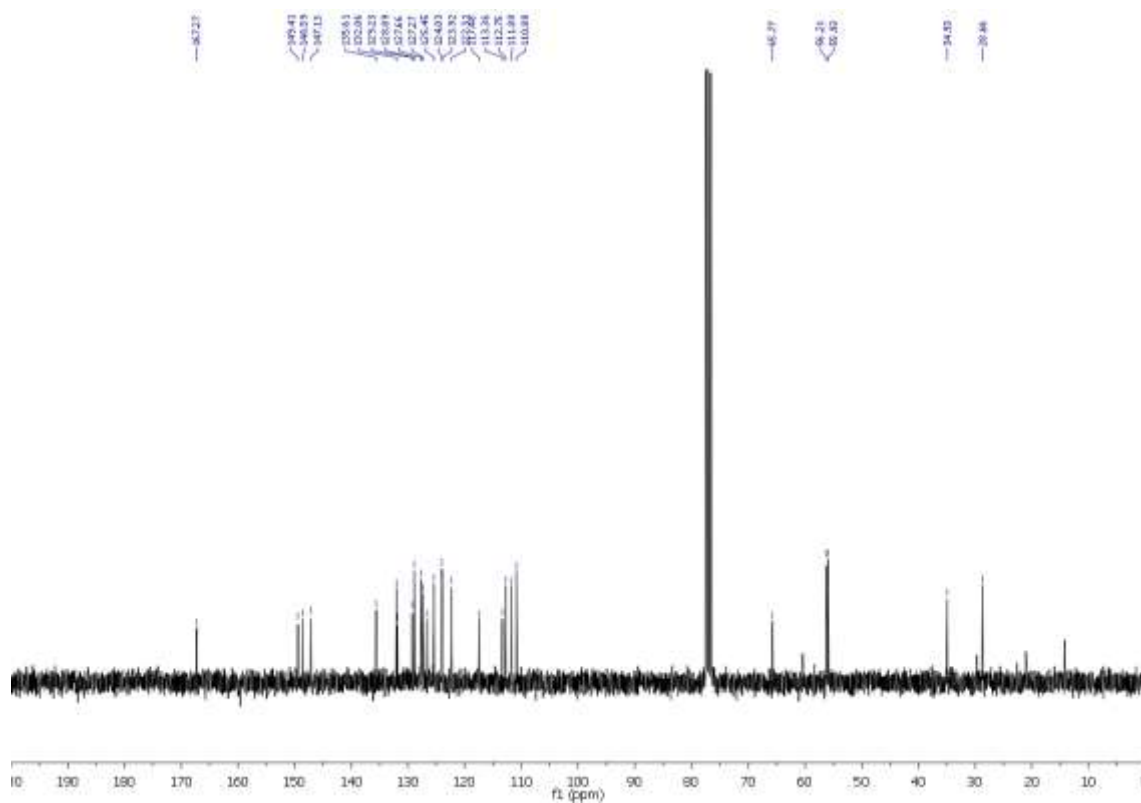
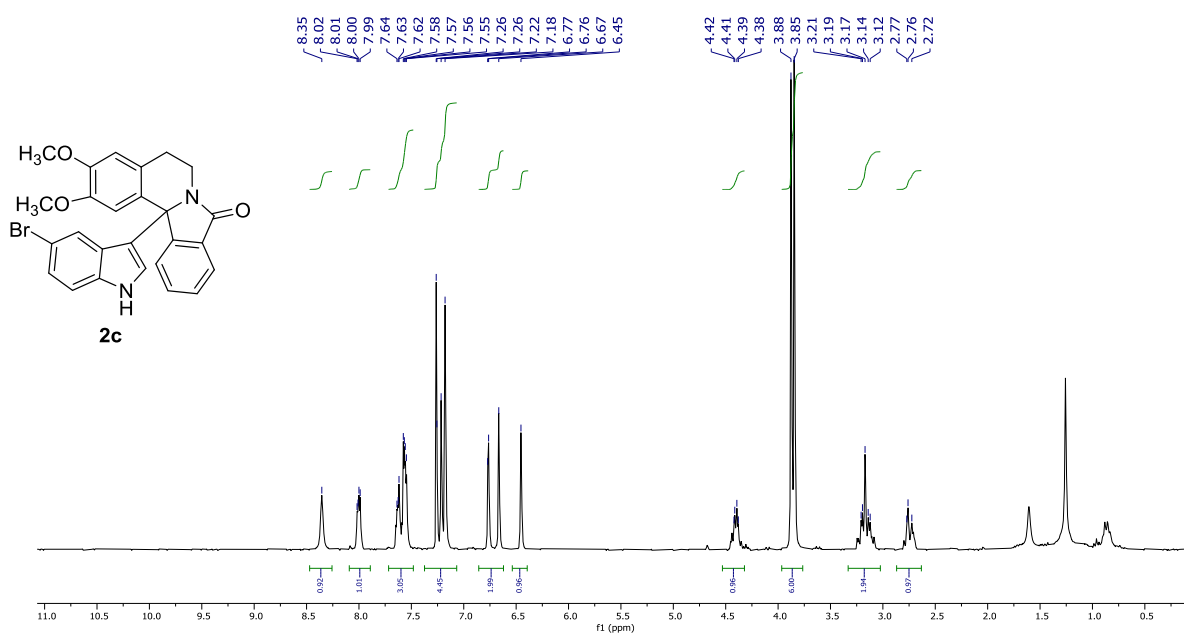
RT	Area	% Area	Height
1 23.295	35583127	38.17	718953
2 29.501	57638288	61.83	887221

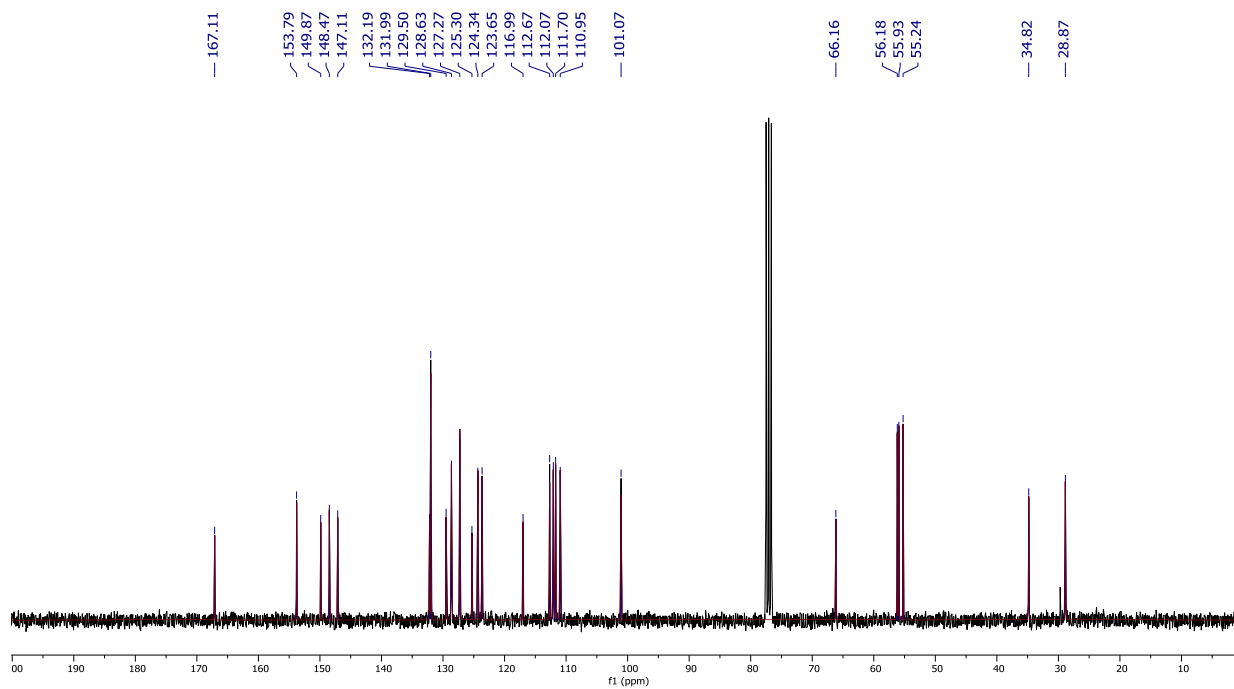
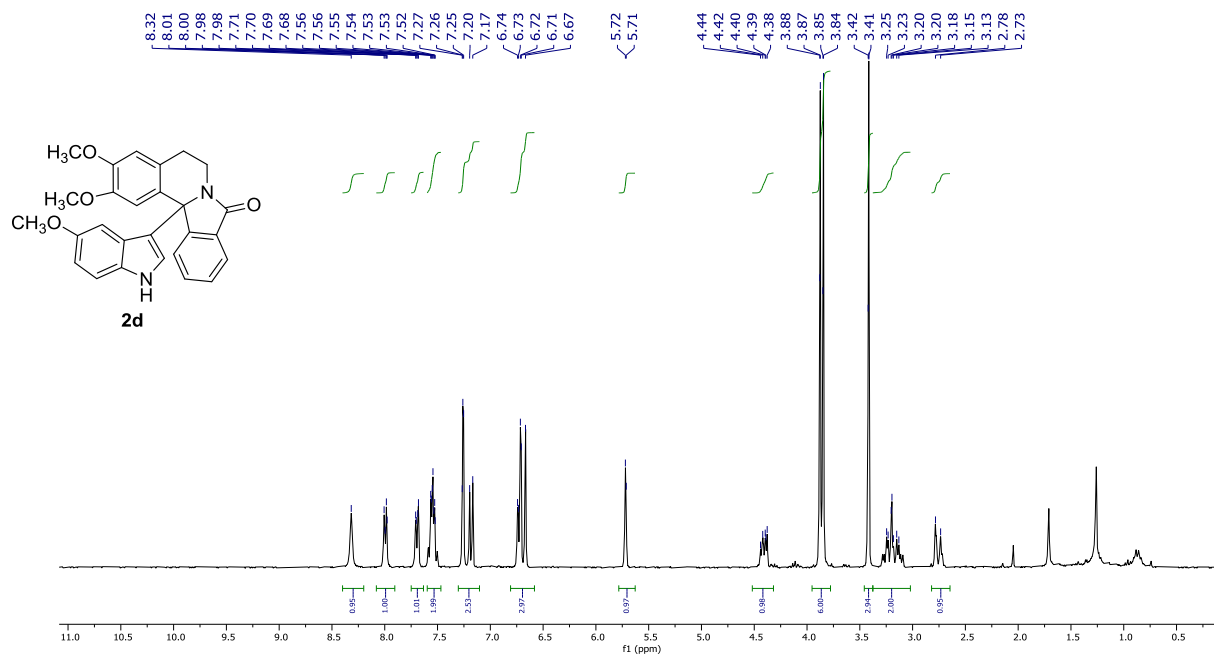
## 5. Copies of $^1\text{H}$ and $^{13}\text{C}$ NMR of 2a-e

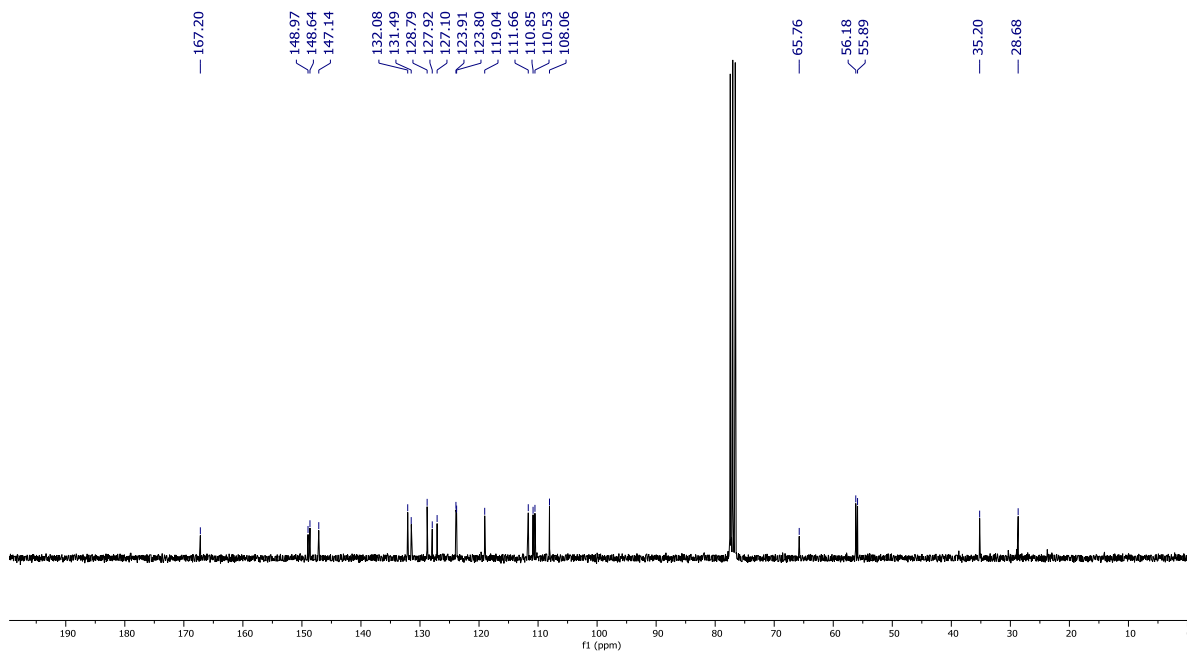
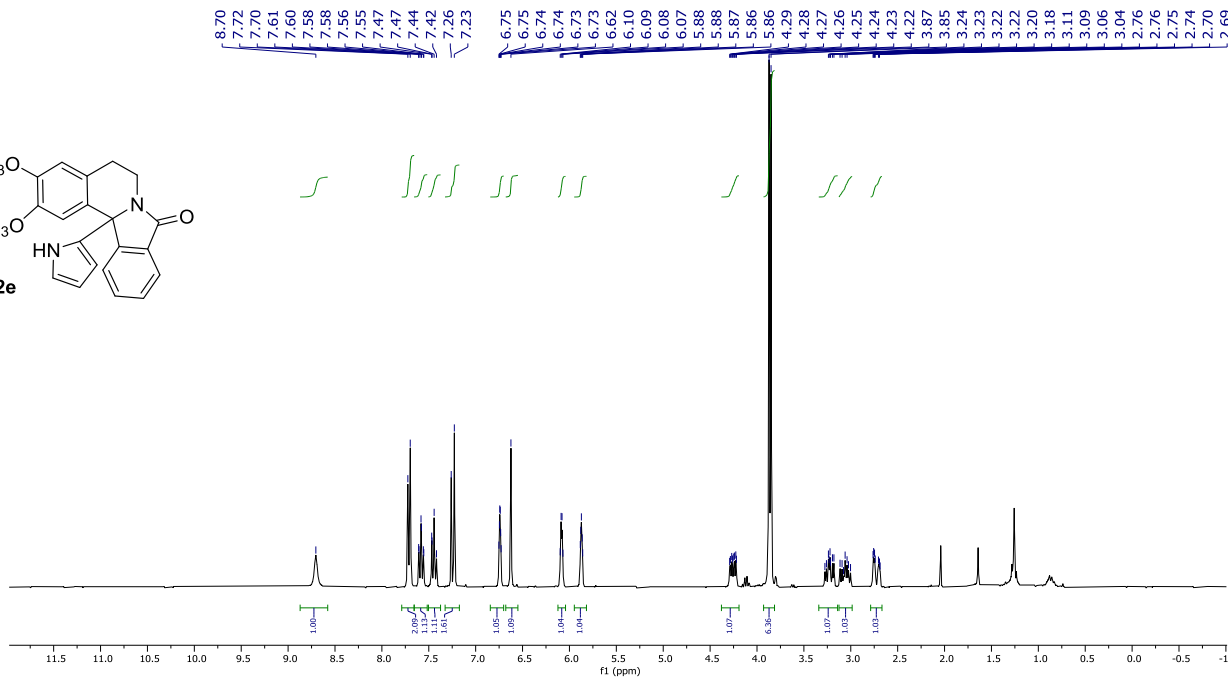
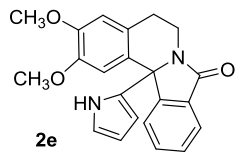






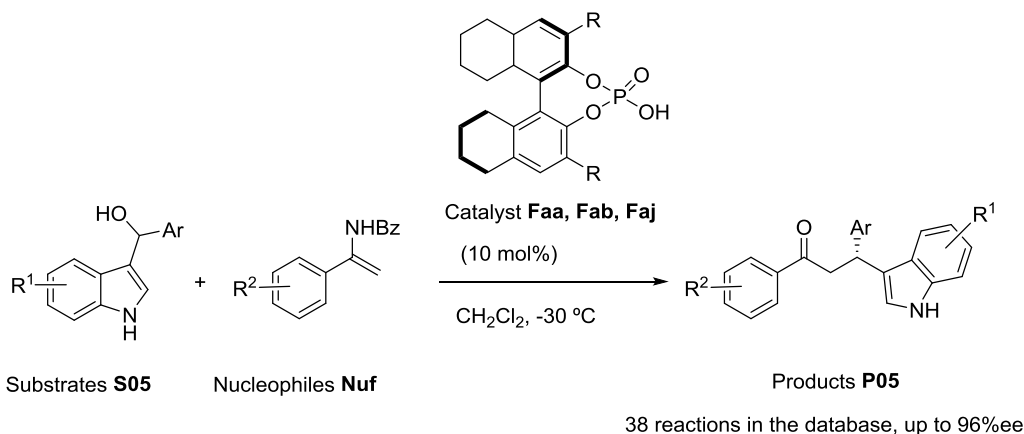




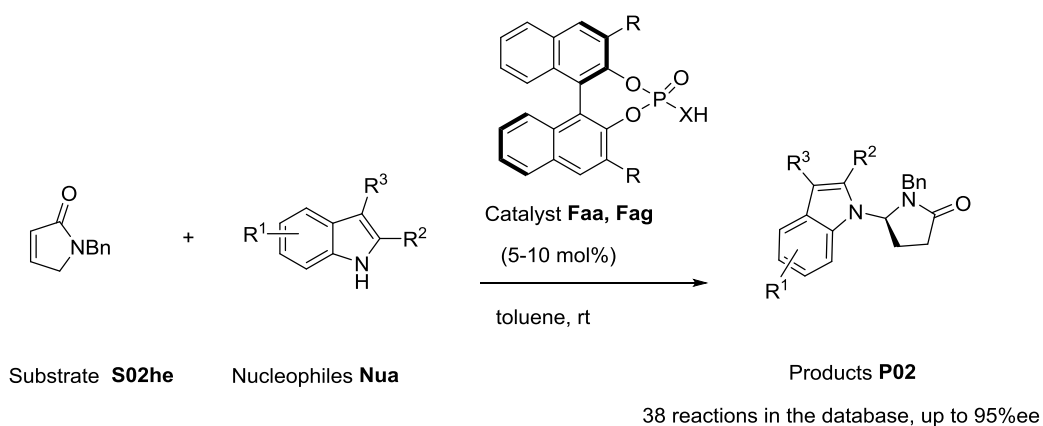


## 6. General reaction equations for the reference reactions in the database

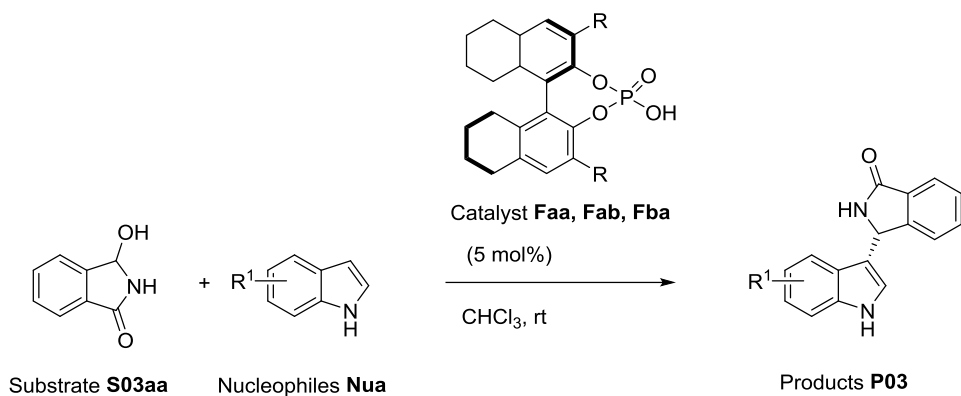
In the following schemes the general equations for the reactions included in the database are shown including the bibliographic reference. FileSI02.xls contains the full experimental detail for each reaction (substrate, nucleophile, catalyst, reaction conditions, yield, and ee). Molecule codes are depicted in the next section.



**Scheme S1.** General reaction from: Guo, Q. X.; Peng, Y. G.; Zhang, J. W.; Song, L.; Feng, Z.; Gong, L. Z. *Org. Lett.* **2009**, 11, 4620;

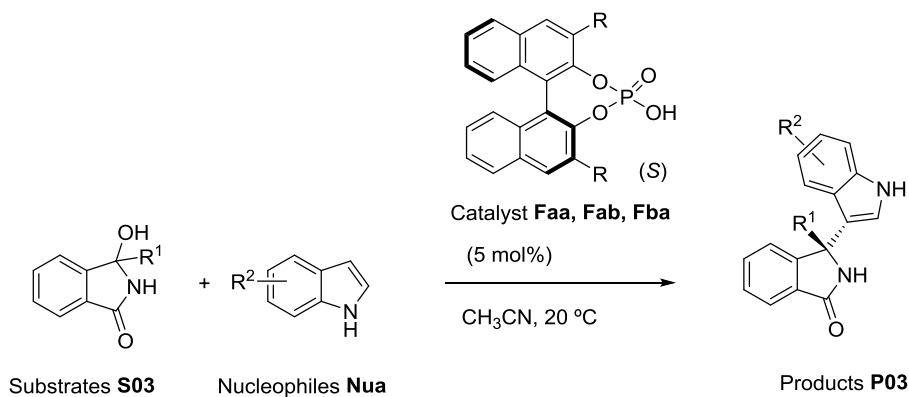


**Scheme S2.** General reaction from: Xie, Y.; Zhao, Y.; Qian, B.; Yang, L.; Xia, C.; Huang, H. *Angew. Chem. Int. Ed.* **2011**, 50, 5682;



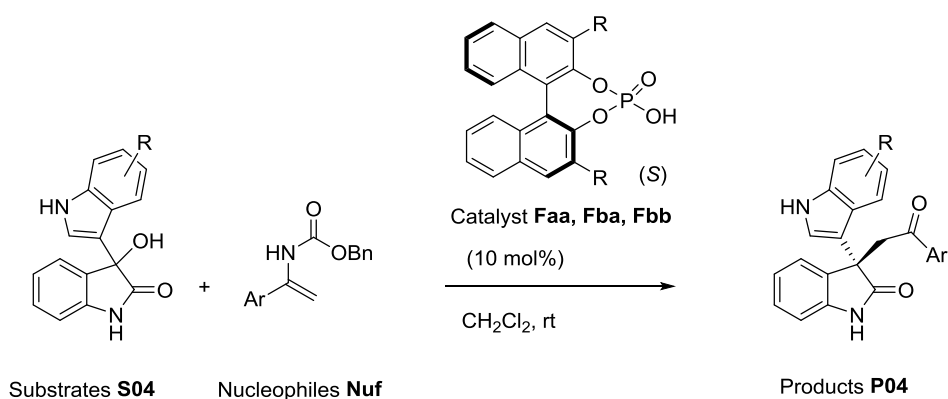
33 reactions in the database, up to 83%ee

**Scheme S3.** General reaction from: Yu, X.; Lu, A.; Wang, Y.; Wu, G.; Song, H.; Zhou, Z.; Tang, C. *Eur. J. Org. Chem.* **2011**, 892;



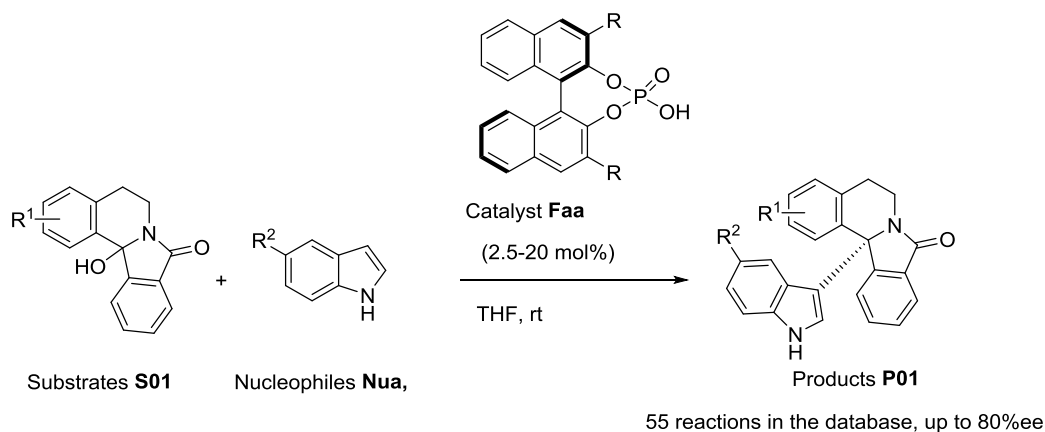
52 reactions in the database, up to -95%ee

**Scheme S4.** General reaction from: Yu, X.; Lu, A.; Wang, Y.; Wu, G.; Song, H.; Zhou, Z.; Tang, C. *Eur. J. Org. Chem.* **2011**, 3060;

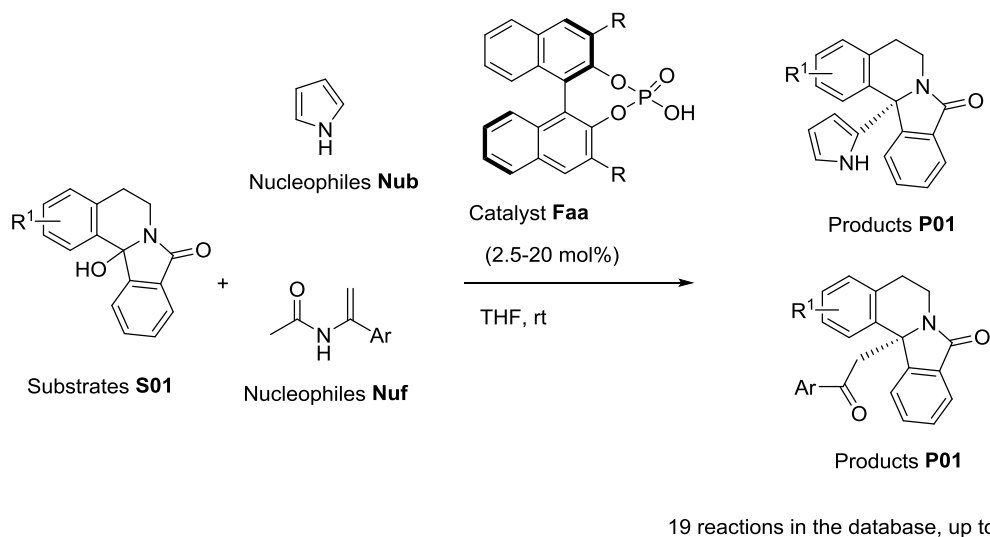


31 reactions in the database, up to -96%ee

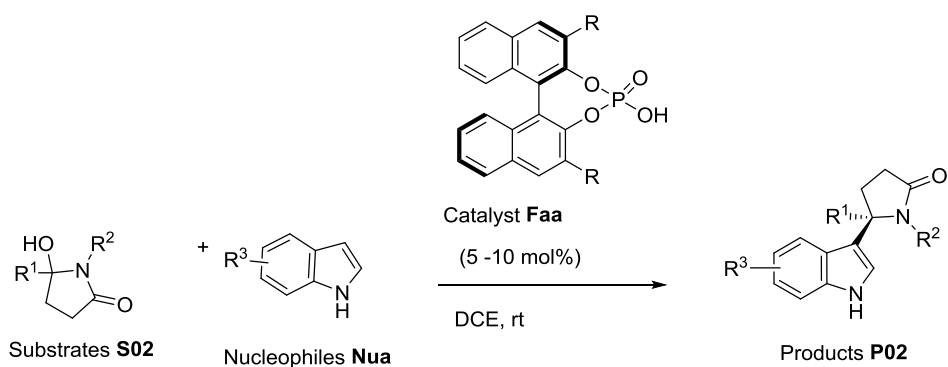
**Scheme S5.** General reaction from: Guo, C.; Song, J.; Huang, J. Z.; Chen, P. H.; Luo, S. W.; Gong, L. Z. *Angew. Chem. Int. Ed.* **2012**, 51, 1046.



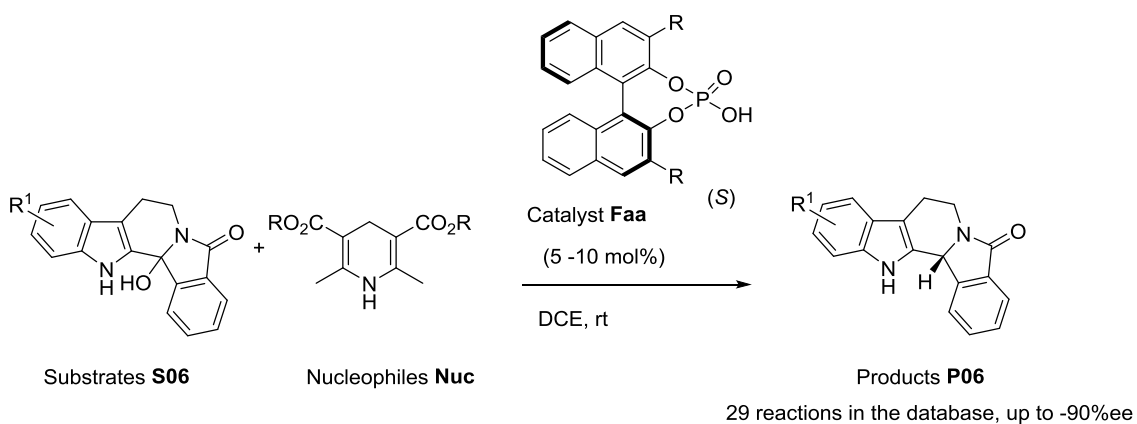
**Scheme S6.** General reaction from: Aranzamendi, E.; Sotomayor, N.; Lete, E. *J. Org. Chem.* **2012**, *77*, 2986.



**Scheme S7.** General reaction from: E. Aranzamendi, Doctoral Thesis, 2014, UPV/EHU (unpublished results), and Aranzamendi, E.; Arrasate, S. Sotomayor, N.; González-Díaz, H.; Lete, E. *ChemistryOpen*. **2016**, *557*, 540.



**Scheme S8.** General reaction from: Courant, T.; Kumarn, S.; He, L.; Retailleau, P.; Masson, G.  
*Adv. Synth. Catal.* **2013**, 355, 836;



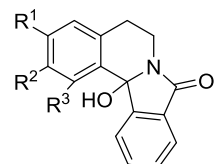
**Scheme S9.** General reaction from: Yin, Q.; Wang, S. -G.; You, S. -L. *Org. Lett.* **2013**, 15, 2688.



## 7. Molecule codes

### SUBSTRATES

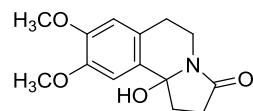
#### S01



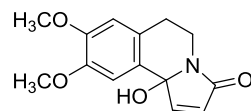
**S01aa**  $R^1 = R^2 = \text{OCH}_3$ ,  $R^3 = \text{H}$

**S01ba**  $R^1 = R^3 = \text{OCH}_3$ ,  $R^2 = \text{H}$

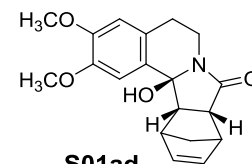
**S01ca**  $R^1 = R^3 = R^2 = \text{OCH}_3$



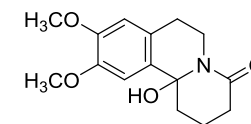
**S01ab**



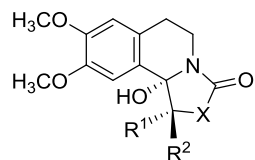
**S01ac**



**S01ad**



**S01ae**



**S01af**  $X = \text{NCH}_3$ ,  $R^1 = R^2 = \text{CH}_3$

**S01ag**  $X = \text{NCH}_3$ ,  $R^1 = \text{H}$ ,  $R^2 = \text{Bn}$

**S01ah**  $X = \text{S}$ ,  $R^1 = R^2 = \text{H}$

**S01ai**  $X = \text{O}$ ,  $R^1 = R^2 = \text{H}$

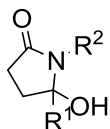
**S01aj**  $X = \text{NCH}_3$ ,  $R^1 = \text{CH}_3$ ,  $R^2 = \text{Bn}$

**S01ak**  $X = \text{S}$ ,  $R^1 = \text{H}$ ,  $R^2 = \text{Bn}$

**S01al**  $X = \text{S}$ ,  $R^1 = \text{CH}_3$ ,  $R^2 = \text{H}$

**S01am**  $X = \text{S}$ ,  $R^1 = \text{Ph}$ ,  $R^2 = \text{CH}_3$

**S02**



**S02aa** R<sup>1</sup> = H, R<sup>2</sup> = Ph

**S02ac** R<sup>1</sup> = H, R<sup>2</sup> = 4-BrC<sub>6</sub>H<sub>4</sub>

**S02ad** R<sup>1</sup> = H, R<sup>2</sup> = 4-IC<sub>6</sub>H<sub>4</sub>

**S02ae** R<sup>1</sup> = H, R<sup>2</sup> = Bn

**S02aa** R<sup>1</sup> = H, R<sup>2</sup> = Ph

**S02ac** R<sup>1</sup> = H, R<sup>2</sup> = 4-BrC<sub>6</sub>H<sub>4</sub>

**S02ad** R<sup>1</sup> = H, R<sup>2</sup> = 4-IC<sub>6</sub>H<sub>4</sub>

**S02bb** R<sup>1</sup> = CH<sub>3</sub>, R<sup>2</sup> = 4-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>

**S02be** R<sup>1</sup> = CH<sub>3</sub>, R<sup>2</sup> = Bn

**S02bf** R<sup>1</sup> = CH<sub>3</sub>, R<sup>2</sup> = 2-CH<sub>3</sub>OC<sub>6</sub>H<sub>4</sub>CH<sub>2</sub>

**S02bg** R<sup>1</sup> = CH<sub>3</sub>, R<sup>2</sup> = 4-CH<sub>3</sub>OC<sub>6</sub>H<sub>4</sub>CH<sub>2</sub>

**S02bh** R<sup>1</sup> = CH<sub>3</sub>, R<sup>2</sup> = allyl

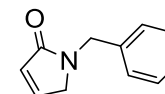
**S02ce** R<sup>1</sup> = Et, R<sup>2</sup> = Bn

**S02de** R<sup>1</sup> = propyl, R<sup>2</sup> = Bn

**S02ee** R<sup>1</sup> = *n*Bu, R<sup>2</sup> = Bn

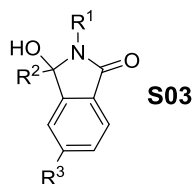
**S02fe** R<sup>1</sup> = pentyl, R<sup>2</sup> = Bn

**S02ge** R<sup>1</sup> = Bn, R<sup>2</sup> = Bn



**S02he**

**S03**



**S03aa** R<sup>1</sup> = H, R<sup>2</sup> = H, R<sup>3</sup> = H

**S03ab** R<sup>1</sup> = H, R<sup>2</sup> = H, R<sup>3</sup> = Br

**S03ba** R<sup>1</sup> = H, R<sup>2</sup> = CH<sub>3</sub>, R<sup>3</sup> = H

**S03ca** R<sup>1</sup> = H, R<sup>2</sup> = Et, R<sup>3</sup> = H

**S03da** R<sup>1</sup> = H, R<sup>2</sup> = Bu, R<sup>3</sup> = H

**S03ea** R<sup>1</sup> = H, R<sup>2</sup> = allyl, R<sup>3</sup> = H

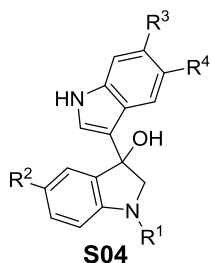
**S03fa** R<sup>1</sup> = H, R<sup>2</sup> = Ph, R<sup>3</sup> = H

**S03ac** R<sup>1</sup> = CH<sub>3</sub>, R<sup>2</sup> = R<sup>3</sup> = H

**S03ad** R<sup>1</sup> = Ph, R<sup>2</sup> = R<sup>3</sup> = H

**S03da** R<sup>1</sup> = H, R<sup>2</sup> = Bu, R<sup>3</sup> = H

**S04**



**S04aa** R<sup>1</sup> = R<sup>2</sup> = R<sup>3</sup> = R<sup>4</sup> = H

**S04ac** R<sup>1</sup> = tertbutylacetyl, R<sup>2</sup> = R<sup>3</sup> = R<sup>4</sup> = H

**S04ca** R<sup>1</sup> = R<sup>2</sup> = R<sup>3</sup> = H, R<sup>4</sup> = Br

**S04da** R<sup>1</sup> = R<sup>2</sup> = R<sup>3</sup> = H, R<sup>4</sup> = OCH<sub>3</sub>

**S04ea** R<sup>1</sup> = R<sup>2</sup> = R<sup>3</sup> = H, R<sup>4</sup> = Cl

**S04fa** R<sup>1</sup> = R<sup>2</sup> = H, R<sup>3</sup> = CH<sub>3</sub>, R<sup>4</sup> = H

**S04ga** R<sup>1</sup> = R<sup>2</sup> = R<sup>3</sup> = H, R<sup>4</sup> = F

**S04ha** R<sup>1</sup> = R<sup>2</sup> = R<sup>3</sup> = F, R<sup>4</sup> = H

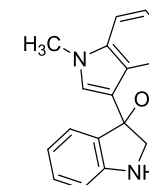
**S04ad** R<sup>1</sup> = H, R<sup>2</sup> = F, R<sup>3</sup> = R<sup>4</sup> = H

**S04ae** R<sup>1</sup> = H, R<sup>2</sup> = CH<sub>3</sub>, R<sup>3</sup> = R<sup>4</sup> = H

**S04fe** R<sup>1</sup> = H, R<sup>2</sup> = R<sup>3</sup> = CH<sub>3</sub>, R<sup>4</sup> = H

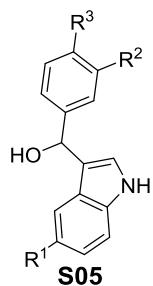
**S04fd** R<sup>1</sup> = H, R<sup>2</sup> = F, R<sup>3</sup> = CH<sub>3</sub>, R<sup>4</sup> = H

**S04hd** R<sup>1</sup> = H, R<sup>2</sup> = F, R<sup>3</sup> = H, R<sup>4</sup> = F



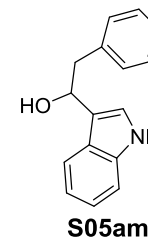
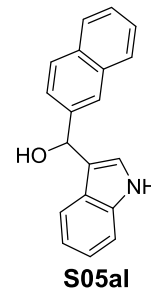
**S04ba**

**S05**

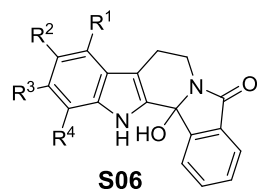


- S05aa** R<sup>1</sup> = R<sup>2</sup> = R<sup>3</sup> = H  
**S05ab** R<sup>1</sup> = R<sup>2</sup> = H, R<sup>3</sup> = CH<sub>3</sub>  
**S05ac** R<sup>1</sup> = R<sup>2</sup> = H, R<sup>3</sup> = Cl  
**S05ad** R<sup>1</sup> = R<sup>2</sup> = H, R<sup>3</sup> = Br  
**S05ae** R<sup>1</sup> = R<sup>2</sup> = H, R<sup>3</sup> = CN  
**S05af** R<sup>1</sup> = R<sup>2</sup> = H, R<sup>3</sup> = CF<sub>3</sub>  
**S05ag** R<sup>1</sup> = H, R<sup>2</sup> = F, R<sup>3</sup> = H  
**S05ah** R<sup>1</sup> = H, R<sup>2</sup> = NO<sub>2</sub>, R<sup>3</sup> = H

- S05ai** R<sup>1</sup> = H, R<sup>2</sup> = CN, R<sup>3</sup> = H  
**S05aj** R<sup>1</sup> = H, R<sup>2</sup> = R<sup>3</sup> = F  
**S05ak** R<sup>1</sup> = H, R<sup>2</sup> = Cl, R<sup>3</sup> = F  
**S05be** R<sup>1</sup> = Cl, R<sup>2</sup> = H, R<sup>3</sup> = CN  
**S05ce** R<sup>1</sup> = Br, R<sup>2</sup> = H, R<sup>3</sup> = CN  
**S05de** R<sup>1</sup> = CH<sub>3</sub>, R<sup>2</sup> = H, R<sup>3</sup> = CN



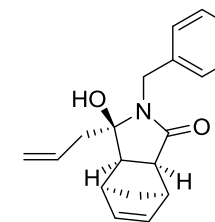
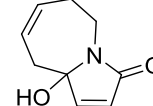
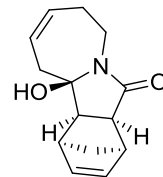
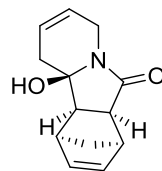
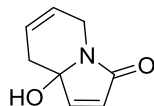
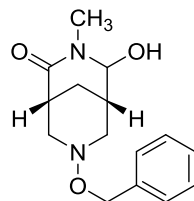
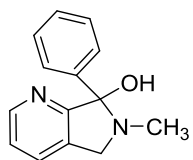
**S06**



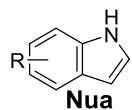
- S06aa** R<sup>1</sup> = R<sup>2</sup> = R<sup>3</sup> = R<sup>4</sup> = H  
**S06ba** R<sup>1</sup> = CH<sub>3</sub>, R<sup>2</sup> = R<sup>3</sup> = R<sup>4</sup> = H  
**S06ca** R<sup>1</sup> = H, R<sup>2</sup> = CH<sub>3</sub>, R<sup>3</sup> = R<sup>4</sup> = H  
**S06da** R<sup>1</sup> = R<sup>2</sup> = H, R<sup>3</sup> = CH<sub>3</sub>, R<sup>4</sup> = H  
**S06ea** R<sup>1</sup> = R<sup>2</sup> = R<sup>3</sup> = H, R<sup>4</sup> = CH<sub>3</sub>

- S06fa** R<sup>1</sup> = H, R<sup>2</sup> = OCH<sub>3</sub>, R<sup>3</sup> = R<sup>4</sup> = H  
**S06ga** R<sup>1</sup> = H, R<sup>2</sup> = Cl, R<sup>3</sup> = R<sup>4</sup> = H  
**S06ha** R<sup>1</sup> = H, R<sup>2</sup> = Br, R<sup>3</sup> = R<sup>4</sup> = H  
**S06ia** R<sup>1</sup> = R<sup>2</sup> = H, R<sup>3</sup> = Br, R<sup>4</sup> = H  
**S06ja** R<sup>1</sup> = H, R<sup>2</sup> = F, R<sup>3</sup> = R<sup>4</sup> = H

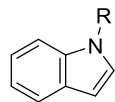
**S07-S09**



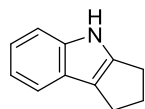
NUCLEOPHILES



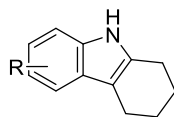
<b>Nua01</b>	R = H	<b>Nua08</b>	R = 5-NO <sub>2</sub>	<b>Nua15</b>	R = 2,3-CH <sub>3</sub>	<b>Nua22</b>	R = 7-OBn
<b>Nua02</b>	R = 6-OCH <sub>3</sub>	<b>Nua09</b>	R = 6-F	<b>Nua16</b>	R = 2-Et-3-CH <sub>3</sub>	<b>Nua23</b>	R = 6-OBn
<b>Nua03</b>	R = 5-OCH <sub>3</sub>	<b>Nua10</b>	R = 5-F	<b>Nua17</b>	R = 2-CH <sub>3</sub> -5-pent	<b>Nua24</b>	R = 5-OBn
<b>Nua04</b>	R = 5-Br	<b>Nua11</b>	R = 7-CH <sub>3</sub>	<b>Nua18</b>	R = 2-BrEt	<b>Nua25</b>	R = 4-OBn
<b>Nua05</b>	R = 6-Cl	<b>Nua12</b>	R = 5-CH <sub>3</sub>	<b>Nua19</b>	R = 2,3-CH <sub>3</sub> -5-Cl		
<b>Nua06</b>	R = 6-Cl	<b>Nua13</b>	R = 3-CH <sub>3</sub>	<b>Nua20</b>	R = 2-Ph		
<b>Nua07</b>	R = 5-Cl	<b>Nua14</b>	R = 2-CH <sub>3</sub>	<b>Nua21</b>	R = 2-(2'-CH <sub>3</sub> )C <sub>6</sub> H <sub>4</sub>		



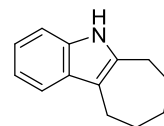
**Nua26** R = Bn  
**Nua33** R = CH<sub>3</sub>



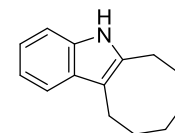
**Nua27**



**Nua28** R = H  
**Nua29** R = 6-CH<sub>3</sub>  
**Mua30** R = 6-Cl



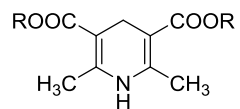
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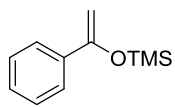
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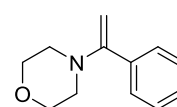
**Nub01**



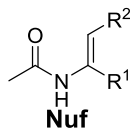
**Nuc01** R = *t*Bu  
**Nuc02** R = Et



**Nud01**



**Nue01**



**Nuf01** R<sup>1</sup> = Ph, R<sup>2</sup> = H

**Nuf110** R<sup>1</sup> = 4-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf12** R<sup>1</sup> = 4-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf13** R<sup>1</sup> = 4-CH<sub>3</sub>CONHC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf14** R<sup>1</sup> = 4-BrC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf15** R<sup>1</sup> = 4-ClC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf16** R<sup>1</sup> = 4-FC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf17** R<sup>1</sup> = 4-NO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf18** R<sup>1</sup> = 3-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf19** R<sup>1</sup> = 3,4-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H

**Nuf20** R<sup>1</sup> = 2,5-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H

**Nuf21** R<sup>1</sup> = 2-naphthyl, R<sup>2</sup> = H

**Nuf22** R<sup>1</sup> = 5,6,7,8-tetrahydronaphth-2-yl  
R<sup>2</sup> = H

**Nuf23** R<sup>1</sup> = Ph, R<sup>2</sup> = CH<sub>3</sub>

**Nuf87** R<sup>1</sup> = 4-CH<sub>3</sub>, R<sup>2</sup> = CH<sub>3</sub>

**Nuf88** R<sup>1</sup> = 4-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = CH<sub>3</sub>

**Nuf89** R<sup>1</sup> = 4-CH<sub>3</sub>CONHC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = CH<sub>3</sub>

**Nuf90** R<sup>1</sup> = 4-BrC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = CH<sub>3</sub>

**Nuf91** R<sup>1</sup> = 4-ClC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = CH<sub>3</sub>

**Nuf92** R<sup>1</sup> = 4-FC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = CH<sub>3</sub>

**Nuf93** R<sup>1</sup> = 4-NO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = CH<sub>3</sub>

**Nuf94** R<sup>1</sup> = 3-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = CH<sub>3</sub>

**Nuf95** R<sup>1</sup> = 3,4-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = CH<sub>3</sub>

**Nuf96** R<sup>1</sup> = 2,5-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = CH<sub>3</sub>

**Nuf97** R<sup>1</sup> = 2-naphthyl, R<sup>2</sup> = CH<sub>3</sub>

**Nuf98** R<sup>1</sup> = 5,6,7,8-tetrahydronaphthyl, R<sup>2</sup> = CH<sub>3</sub>

**Nuf101** R<sup>1</sup> = 3,4-ClC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf102** R<sup>1</sup> = 4-CH<sub>3</sub>OCOPh, R<sup>2</sup> = H

**Nuf103** R<sup>1</sup> = 3-CNC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf105** R<sup>1</sup> = pyridine-3-yl, R<sup>2</sup> = H

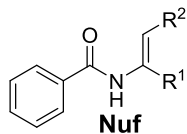
**Nuf106** R<sup>1</sup> = 3-(1'-(phenylsulfonyl)-1H-pyrrol-3-yl), R<sup>2</sup> = H

**Nuf104** R<sup>1</sup> = 2,3-dihydrobenzo[b][1,4]dioxin-6-yl, R<sup>2</sup> = H

**Nuf107** R<sup>1</sup> = thiophene-2-yl, R<sup>2</sup> = H

**Nuf108** R<sup>1</sup> = benzofuran-2-yl, R<sup>2</sup> = H

**Nuf109** R<sup>1</sup> = styryl, R<sup>2</sup> = H



**Nuf24** R<sup>1</sup> = 4-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf25** R<sup>1</sup> = 4-CH<sub>3</sub>CONHC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf26** R<sup>1</sup> = 4-BrC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf27** R<sup>1</sup> = 4-FC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf28** R<sup>1</sup> = 4-NO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf29** R<sup>1</sup> = 3,4-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf30** R<sup>1</sup> = 2,5-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H

**Nuf31** R<sup>1</sup> = 2-naphthyl, R<sup>2</sup> = H

**Nuf32** R<sup>1</sup> = 3-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf33** R<sup>1</sup> = 5,6,7,8-tetrahydronaphthyl  
R<sup>2</sup> = H

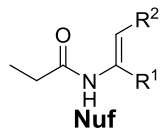
**Nuf36** R<sup>1</sup> = Ph, R<sup>2</sup> = CH<sub>3</sub>

**Nuf02** R<sup>1</sup> = Ph, R<sup>2</sup> = H

**Nuf03** R<sup>1</sup> = 4-ClC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf04** R<sup>1</sup> = 4-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf05** R<sup>1</sup> = Ph, R<sup>2</sup> = CH<sub>3</sub>



**Nuf34** R<sup>1</sup> = 4-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf35** R<sup>1</sup> = 4-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf37** R<sup>1</sup> = 4-ClC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf38** R<sup>1</sup> = 4-CH<sub>3</sub>CONHC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf39** R<sup>1</sup> = 4-BrC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf40** R<sup>1</sup> = 4-FC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf41** R<sup>1</sup> = 4-NO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf42** R<sup>1</sup> = 3-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf43** R<sup>1</sup> = 3,4-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H

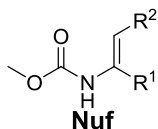
**Nuf44** R<sup>1</sup> = 2,5-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H

**Nuf45** R<sup>1</sup> = 2-naphthyl, R<sup>2</sup> = H

**Nuf46**

**Nuf47** R<sup>1</sup> = Ph, R<sup>2</sup> = CH<sub>3</sub>

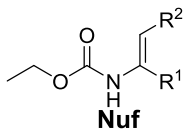
**Nuf06** R<sup>1</sup> = Ph, R<sup>2</sup> = H



**Nuf48** R<sup>1</sup> = 4-ClC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf49** R<sup>1</sup> = 4-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf50** R<sup>1</sup> = 4-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf51** R<sup>1</sup> = 4-CH<sub>3</sub>CONHC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf52** R<sup>1</sup> = 4-BrC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf54** R<sup>1</sup> = 4-FC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf55** R<sup>1</sup> = 4-NO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf56** R<sup>1</sup> = 3-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf57** R<sup>1</sup> = 3,4-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H  
**Nuf58** R<sup>1</sup> = 2,5-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H

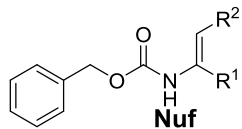
**Nuf59** R<sup>1</sup> = 2-naphthyl, R<sup>2</sup> = H  
**Nuf60**  
**Nuf61** R<sup>1</sup> = Ph, R<sup>2</sup> = CH<sub>3</sub>  
**Nuf07** R<sup>1</sup> = Ph, R<sup>2</sup> = H



**Nuf62** R<sup>1</sup> = 4-ClC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf63** R<sup>1</sup> = 4-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf64** R<sup>1</sup> = 4-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf65** R<sup>1</sup> = 4-CH<sub>3</sub>CONHC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf66** R<sup>1</sup> = 4-BrC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf68** R<sup>1</sup> = 4-FC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf69** R<sup>1</sup> = 4-NO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf70** R<sup>1</sup> = 3-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf71** R<sup>1</sup> = 3,4-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H  
**Nuf72** R<sup>1</sup> = 2,5-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H

**Nuf73** R<sup>1</sup> = 2-naphthyl, R<sup>2</sup> = H  
**Nuf74**  
**Nuf75** R<sup>1</sup> = Ph, R<sup>2</sup> = CH<sub>3</sub>  
**Nuf08** R<sup>1</sup> = Ph, R<sup>2</sup> = H



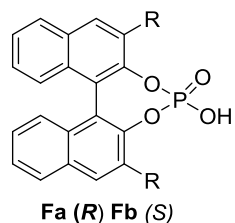
**Nuf76** R<sup>1</sup> = 4-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf77** R<sup>1</sup> = 4-CH<sub>3</sub>CONHC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf78** R<sup>1</sup> = 4-BrC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf79** R<sup>1</sup> = 4-FC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf80** R<sup>1</sup> = 4-NO<sub>2</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

**Nuf81** R<sup>1</sup> = 3-OCH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf82** R<sup>1</sup> = 3,4-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H  
**Nuf83** R<sup>1</sup> = 2,5-(CH<sub>3</sub>)<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, R<sup>2</sup> = H  
**Nuf84** R<sup>1</sup> = 2-naphthyl, R<sup>2</sup> = H  
**Nuf11** R<sup>1</sup> = 4-ClC<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H

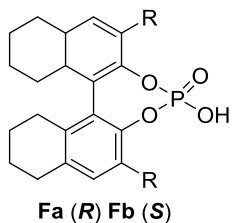
**Nuf86** R<sup>1</sup> = Ph, R<sup>2</sup> = CH<sub>3</sub>  
**Nuf09** R<sup>1</sup> = Ph, R<sup>2</sup> = H  
**Nuf10** R<sup>1</sup> = 4-CH<sub>3</sub>C<sub>6</sub>H<sub>4</sub>, R<sup>2</sup> = H  
**Nuf85**

## CATALYSTS

### Phosphoric acids

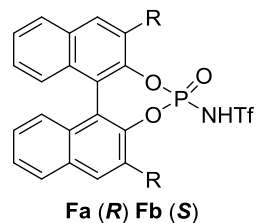


<b>Faa01</b>	R = H	<b>Faa08</b>	R = 4-CH <sub>3</sub> OC <sub>6</sub> H <sub>4</sub>	<b>Fba15</b>	R = POPh <sub>2</sub>
<b>Fba01</b>	R = H	<b>Faa09</b>	R = 1-naphthyl	<b>Faa16</b>	R = 4-CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub>
<b>Faa02</b>	R = 9-anthracyl	<b>Fba09</b>	R = 1-naphthyl	<b>Faa17</b>	R = 3,5-F <sub>2</sub> C <sub>6</sub> H <sub>3</sub>
<b>Fba02</b>	R = 9-anthracyl	<b>Faa10</b>	R = 2,4,6-( <i>i</i> Pr) <sub>3</sub> C <sub>6</sub> H <sub>2</sub>	<b>Faa18</b>	R = 4-(2',4',6'-(CH <sub>3</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub> )C <sub>6</sub> H <sub>5</sub>
<b>Faa03</b>	R = SiCH <sub>3</sub> Ph <sub>2</sub>	<b>Fba10</b>	R = 2,4,6-( <i>i</i> Pr) <sub>3</sub> C <sub>6</sub> H <sub>2</sub>	<b>Faa19</b>	R = 2,4,6-(CH <sub>3</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub>
<b>Faa04</b>	R = 9-phenanthryl	<b>Faa11</b>	R = SiPh <sub>3</sub>	<b>Faa20</b>	R = 3,5-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>
<b>Faa05</b>	R = 2-naphthyl	<b>Fba11</b>	R = SiPh <sub>3</sub>	<b>Faa21</b>	R = 4-(4'- <i>t</i> BuC <sub>6</sub> H <sub>4</sub> )C <sub>6</sub> H <sub>4</sub>
<b>Fba05</b>	R = 2-naphthyl	<b>Faa12</b>	R = 3,5-(CF <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>	<b>Faa22</b>	R = 4-(4'- <i>t</i> Bu-2',6'-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub> )C <sub>6</sub> H <sub>4</sub>
<b>Faa06</b>	R = Ph	<b>Fba12</b>	R = 3,5-(CF <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>	<b>Faa23</b>	R = CF <sub>3</sub>
<b>Fba06</b>	R = Ph	<b>Fba13</b>	R = 4-ClC <sub>6</sub> H <sub>4</sub>	<b>Faa24</b>	R = 3,5-( <i>t</i> Bu) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>
<b>Faa07</b>	R = 4-NO <sub>2</sub> C <sub>6</sub> H <sub>4</sub>	<b>Fba14</b>	R = 1,1'-biphenyl	<b>Faa25</b>	R = 4- <i>t</i> BuC <sub>6</sub> H <sub>5</sub>

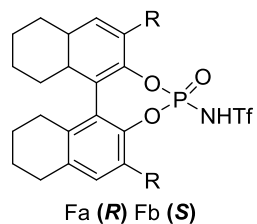


<b>Fab01</b>	R = 4-ClC <sub>6</sub> H <sub>4</sub>	<b>Fab09</b>	R = 4-NO <sub>2</sub> C <sub>6</sub> H <sub>4</sub>	<b>Fab18</b>	R = 3,5-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>
<b>Fab02</b>	R = SiPh <sub>3</sub>	<b>Fab10</b>	R = 4-CH <sub>3</sub> OC <sub>6</sub> H <sub>4</sub>	<b>Fab19</b>	R = 4-(4'- <i>t</i> BuC <sub>6</sub> H <sub>4</sub> )C <sub>6</sub> H <sub>4</sub>
<b>Fab03</b>	R = Ph	<b>Fab11</b>	R = 1-naphthyl	<b>Fab20</b>	R = 4-(4'- <i>t</i> Bu-2',6'-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub> )C <sub>6</sub> H <sub>4</sub>
<b>Fab04</b>	R = 2-naphthyl	<b>Fab12</b>	R = 2,4,6-( <i>i</i> Pr) <sub>3</sub> C <sub>6</sub> H <sub>2</sub>	<b>Fab21</b>	R = CF <sub>3</sub>
<b>Fab05</b>	R = 9-phenanthryl	<b>Fab13</b>	R = 3,5-(CF <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>	<b>Fab22</b>	R = 3,5-( <i>t</i> Bu) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>
<b>Fbb05</b>	R = 9-phenanthryl	<b>Fab14</b>	R = POPh <sub>2</sub>	<b>Fab23</b>	R = SiCH <sub>3</sub> Ph <sub>2</sub>
<b>Fab06</b>	R = H	<b>Fab15</b>	R = 4-CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub>	<b>Fab24</b>	R = 3,5-F <sub>2</sub> Ph
<b>Fab07</b>	R = 9-anthracyl	<b>Fab16</b>	R = 4-(2',4',6'-(CH <sub>3</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub> )C <sub>6</sub> H <sub>4</sub>	<b>Fab25</b>	R = 4- <i>t</i> BuC <sub>6</sub> H <sub>5</sub>
<b>Fab08</b>	R = 1,1'-biphenyl	<b>Fab17</b>	R = 2,4,6-(CH <sub>3</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub>		

## N-Triflylphosphoramides



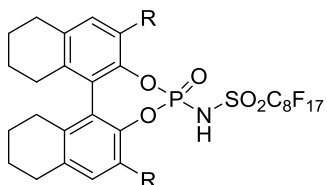
<b>Fac01</b>	R = Ph	<b>Fac10</b>	R = 4-CH <sub>3</sub> OC <sub>6</sub> H <sub>4</sub>	<b>Fac19</b>	R = 3,5-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>
<b>Fac02</b>	R = 9-phenanthryl	<b>Fac11</b>	R = 1-naphthyl	<b>Fac20</b>	R = 4-(4'-tBuC <sub>6</sub> H <sub>4</sub> )C <sub>6</sub> H <sub>4</sub>
<b>Fac03</b>	R = 9-anthracyl	<b>Fac12</b>	R = 2,4,6-(iPr) <sub>3</sub> C <sub>6</sub> H <sub>2</sub>	<b>Fac21</b>	R = 4-(4'-tBu-2',6'-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub> )C <sub>6</sub> H <sub>4</sub>
<b>Fac04</b>	R = 3,5-CF <sub>3</sub> C <sub>6</sub> H <sub>3</sub>	<b>Fac13</b>	R = 4-Cl C <sub>6</sub> H <sub>4</sub>	<b>Fac22</b>	R = CF <sub>3</sub>
<b>Fac05</b>	R = 4-NO <sub>2</sub> C <sub>6</sub> H <sub>4</sub>	<b>Fac14</b>	R = POPh <sub>2</sub>	<b>Fac23</b>	R = 3,5-(tBu) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>
<b>Fac06</b>	R = 1,1'-biphenyl	<b>Fac15</b>	R = 4-CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub>	<b>Fac24</b>	R = SiCH <sub>3</sub> Ph <sub>2</sub>
<b>Fac07</b>	R = SiPh <sub>3</sub>	<b>Fac16</b>	R = 3,5-F <sub>2</sub> Ph	<b>Fac25</b>	R = 4-tBuC <sub>6</sub> H <sub>5</sub>
<b>Fac08</b>	R = H	<b>Fac17</b>	R = 4-(2',4',6'-(CH <sub>3</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub> )C <sub>6</sub> H <sub>4</sub>		
<b>Fac09</b>	R = 2-naphthyl	<b>Fac18</b>	R = 2,4,6-(CH <sub>3</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub>		



<b>Fad01</b>	R = SiPh <sub>3</sub>	<b>Fad10</b>	R = 2,4,6-(iPr) <sub>3</sub> C <sub>6</sub> H <sub>2</sub>	<b>Fad19</b>	R = 4-(4'-tBu-2',6'-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub> )C <sub>6</sub> H <sub>4</sub>
<b>Fad02</b>	R = 2-naphthyl	<b>Fad11</b>	R = 4-ClC <sub>6</sub> H <sub>4</sub>	<b>Fad20</b>	R = CF <sub>3</sub>
<b>Fad03</b>	R = 9-phenanthryl	<b>Fad12</b>	R = POPh <sub>2</sub>	<b>Fad21</b>	R = 3,5-(tBu) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>
<b>Fad04</b>	R = 3,5-(CF <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>	<b>Fad13</b>	R = 4-CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub>	<b>Fad22</b>	R = SiCH <sub>3</sub> Ph <sub>2</sub>
<b>Fad05</b>	R = 4-NO <sub>2</sub> C <sub>6</sub> H <sub>4</sub>	<b>Fad14</b>	R = 3,5-FC <sub>6</sub> H <sub>4</sub>	<b>Fad23</b>	R = Ph
<b>Fad06</b>	R = 1,1'-biphenyl	<b>Fad15</b>	R = 4-(2',4',6'-(CH <sub>3</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub> )C <sub>6</sub> H <sub>4</sub>	<b>Fad24</b>	R = 9-anthracenyl
<b>Fad07</b>	R = H	<b>Fad16</b>	R = 2,4,6-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>	<b>Fad25</b>	R = 4-tBuC <sub>6</sub> H <sub>5</sub>
<b>Fad08</b>	R = 4-CH <sub>3</sub> OC <sub>6</sub> H <sub>4</sub>	<b>Fad17</b>	R = 3,5-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>		
<b>Fad09</b>	R = 1-naphthyl	<b>Fad18</b>	R = 4-(4'-tBuC <sub>6</sub> H <sub>4</sub> )C <sub>6</sub> H <sub>4</sub>		

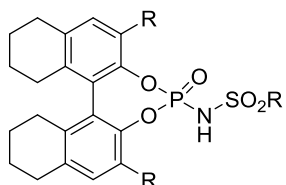


## Miscellaneous



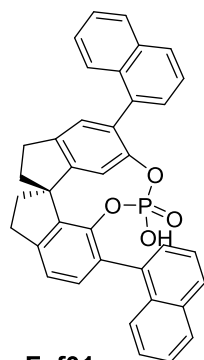
Fa (R) Fb (S)

<b>Faj01</b>	R = SiPh <sub>3</sub>	<b>Faj10</b>	R = 2,4,6-( <i>i</i> Pr) <sub>3</sub> C <sub>6</sub> H <sub>2</sub>	<b>Faj19</b>	R = 4-(4'- <i>t</i> Bu-2',6'-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub> )C <sub>6</sub> H <sub>4</sub>
<b>Faj02</b>	R = 2-naphthyl	<b>Faj11</b>	R = 4-ClC <sub>6</sub> H <sub>4</sub>	<b>Faj20</b>	R = CF <sub>3</sub>
<b>Faj03</b>	R = 9-phenanthryl	<b>Faj12</b>	R = POPh <sub>2</sub>	<b>Faj21</b>	R = 3,5-( <i>t</i> Bu) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>
<b>Faj04</b>	R = 3,5-(CF <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>	<b>Faj13</b>	R = 4-CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub>	<b>Faj22</b>	R = SiCH <sub>3</sub> Ph <sub>2</sub>
<b>Faj05</b>	R = 4-NO <sub>2</sub> C <sub>6</sub> H <sub>4</sub>	<b>Faj14</b>	R = 3,5-FPh	<b>Faj23</b>	R = Ph
<b>Faj06</b>	R = 1,1'-biphenyl	<b>Faj15</b>	R = 4-(2',4',6'-(CH <sub>3</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub> )C <sub>6</sub> H <sub>4</sub>	<b>Faj24</b>	R = 9-anthracyl
<b>Faj07</b>	R = H	<b>Faj16</b>	R = 2,4,6-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>	<b>Faj25</b>	R = 4- <i>t</i> BuC <sub>6</sub> H <sub>5</sub>
<b>Faj08</b>	R = 4-CH <sub>3</sub> OC <sub>6</sub> H <sub>4</sub>	<b>Faj17</b>	R = 3,5-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>		
<b>Faj09</b>	R = 1-naphthyl	<b>Faj18</b>	R = 4-(4'- <i>t</i> BuC <sub>6</sub> H <sub>4</sub> )C <sub>6</sub> H <sub>4</sub>		

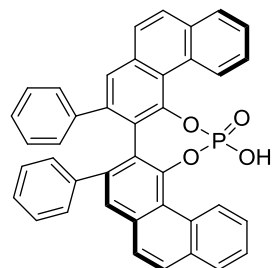


R = 4-CF<sub>3</sub>C<sub>6</sub>H<sub>4</sub>  
Fa (R) Fb (S)

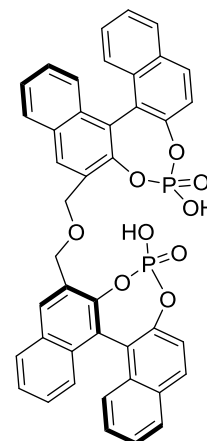
<b>Fak01</b>	R = SiPh <sub>3</sub>	<b>Fak10</b>	R = 2,4,6-( <i>i</i> Pr) <sub>3</sub> C <sub>6</sub> H <sub>2</sub>	<b>Fak19</b>	R = 4-(4'- <i>t</i> Bu-2',6'-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub> )C <sub>6</sub> H <sub>4</sub>
<b>Fak02</b>	R = 2-naphthyl	<b>Fak11</b>	R = 4-ClC <sub>6</sub> H <sub>4</sub>	<b>Fak20</b>	R = CF <sub>3</sub>
<b>Fak03</b>	R = 9-phenanthryl	<b>Fak12</b>	R = POPh <sub>2</sub>	<b>Fak21</b>	R = 3,5-( <i>t</i> Bu) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>
<b>Fak04</b>	R = 3,5-(CF <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>	<b>Fak13</b>	R = 4-CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub>	<b>Fak22</b>	R = SiCH <sub>3</sub> Ph <sub>2</sub>
<b>Fak05</b>	R = 4-NO <sub>2</sub> C <sub>6</sub> H <sub>4</sub>	<b>Fak14</b>	R = 3,5-FPh	<b>Fak23</b>	R = Ph
<b>Fak06</b>	R = 1,1'-biphenyl	<b>Fak15</b>	R = 4-(2',4',6'-(CH <sub>3</sub> ) <sub>3</sub> C <sub>6</sub> H <sub>2</sub> )C <sub>6</sub> H <sub>4</sub>	<b>Fak24</b>	R = 9-anthracyl
<b>Fak07</b>	R = H	<b>Fak16</b>	R = 2,4,6-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>	<b>Fak25</b>	R = 4- <i>t</i> BuC <sub>6</sub> H <sub>5</sub>
<b>Fak08</b>	R = 4-CH <sub>3</sub> OC <sub>6</sub> H <sub>4</sub>	<b>Fak17</b>	R = 3,5-(CH <sub>3</sub> ) <sub>2</sub> C <sub>6</sub> H <sub>3</sub>		
<b>Fak09</b>	R = 1-naphthyl	<b>Fak18</b>	R = 4-(4'- <i>t</i> BuC <sub>6</sub> H <sub>4</sub> )C <sub>6</sub> H <sub>4</sub>		



Faf01



Fae01



Fah01

