Electronic Supplementary Material (ESI) for RSC Advances.


**Supplementary Information**

# Two-photon absorption of 28-hetero-2,7-naphthiporphyrins: expanded carbaporphyrinoid macrocycles

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**Table S1.** Re (γ) and Im (γ) values for **1-S**

| Wavelength (nm) | Re (γ) (esu) | error | Im (γ) (esu) | Error |
|---|---|---|---|---|
| **850** | -3.5712E-33 | ± 1.9607E-34 | -4.0405E-34 | ± 3.4043E-34 |
| **900** | -1.0569E-33 | ± 3.9483E-35 | 5.1589E-34 | ± 3.5625E-35 |
| **950** | -6.0751E-34 | ± 5.0957E-35 | 5.1412E-34 | ± 5.0861E-35 |
| **1000** | -5.6313E-34 | ± 5.7903E-35 | 4.6744E-34 | ± 5.3860E-35 |
| **1050** | -7.7451E-34 | ± 8.1332E-35 | 3.2578E-34 | ± 4.0916E-35 |
| **1100** | -3.2338E-35 | ± 1.0474E-34 | 1.6777E-34 | ± 7.9820E-35 |
| **1150** | -4.1194E-34 | ± 7.8589E-35 | 1.8050E-34 | ± 3.3598E-35 |
| **1200** | -6.5620E-36 | ± 1.0432E-34 | 9.4727E-35 | ± 5.0521E-35 |
| **1250** | -8.1504E-36 | ± 1.0468E-34 | 9.2861E-35 | ± 4.9057E-35 |
| **1300** | 2.7659E-34 | ± 2.8590E-35 | 1.4359E-34 | ± 1.4983E-35 |
| **1350** | -6.9624E-35 | ± 1.0043E-34 | 7.3030E-35 | ± 3.1118E-35 |
| **1400** | 2.5975E-35 | ± 4.8883E-35 | 1.8172E-35 | ± 9.6878E-36 |
| **1450** | -1.2292E-34 | ± 3.3516E-35 | 1.7410E-35 | ± 5.5425E-36 |
| **1500** | -1.8465E-35 | ± 2.1148E-35 | 1.4788E-35 | ± 7.6184E-36 |
| **1550** | 1.4659E-34 | ± 2.6043E-35 | 2.0025E-35 | ± 5.0892E-36 |
| **1600** | 1.4230E-34 | ± 1.1845E-34 | 3.1836E-35 | ± 1.2892E-35 |

**Table S2.** Re (γ) and Im (γ) values for **1-Se** (0.5 % w/w)

| **Wavelength (nm)** | **Re (γ) (esu)** | **error** | **Im (γ) (esu)** | **Error** |
|---|---|---|---|---|
| **800** | -2.2530E-32 | ± 1.4274E-34 | 2.4708E-33 | ± 2.7471E-35 |
| **850** | -8.4909E-33 | ± 8.7946E-35 | 1.5705E-33 | ± 3.0595E-35 |
| **900** | -3.4993E-33 | ± 1.2769E-34 | 1.0889E-33 | ± 1.1327E-34 |
| **950** | -2.0670E-33 | ± 1.3024E-34 | 8.2694E-34 | ± 6.7660E-35 |
| **1000** | -3.2017E-33 | ± 2.8715E-34 | 8.2243E-34 | ± 1.2636E-34 |
| **1050** | -6.5996E-34 | ± 1.1752E-34 | 3.1765E-34 | ± 5.0098E-35 |
| **1100** | --- | --- | --- | --- |
| **1150** | -3.4492E-34 | ± 9.9717E-35 | 1.9433E-34 | ± 4.1586E-35 |
| **1200** | 2.5051E-34 | ± 9.7469E-35 | 8.3267E-35 | ± 2.3968E-35 |
| **1250** | 2.1539E-34 | ± 7.2103E-35 | 7.4886E-35 | ± 2.0662E-35 |
| **1300** | -2.7029E-34 | ± 1.6976E-34 | 1.0195E-34 | ± 3.4529E-35 |
| **1350** | 8.4391E-35 | ± 1.0740E-34 | 6.6697E-35 | ± 2.9714E-35 |
| **1400** | -1.7606E-34 | ± 3.8140E-35 | 1.6705E-34 | ± 3.8140E-35 |
| **1450** | 1.3140E-34 | ± 3.5888E-35 | 3.2753E-35 | ± 1.1400E-35 |
| **1500** | 4.8934E-34 | ± 3.8474E-35 | 1.3134E-35 | ± 6.5016E-36 |
| **1550** | 3.0352E-34 | ± 2.7326E-35 | 2.0087E-35 | ± 7.1425E-36 |
| **1600** | -1.2421E-34 | ± 1.7239E-34 | 9.4166E-36 | ± 9.1641E-36 |

**Table S3.** Re (γ) and Im (γ) values for **1-Se** (1 % w/w)

| **Wavelength (nm)** | **Re (γ) (esu)** | **error** | **Im (γ) (esu)** | **Error** |
|---|---|---|---|---|
| **850** | -6.1452E-33 | ± 8.4422E-35 | 1.3120E-33 | ± 3.3297E-35 |
| **900** | -2.7047E-33 | ± 4.1470E-35 | 1.2136E-33 | ± 5.1846E-35 |
| **950** | -1.5170E-33 | ± 7.0320E-35 | 7.2819E-34 | ± 7.6222E-35 |
| **1000** | -3.1919E-33 | ± 7.3253E-35 | 7.9244E-34 | ± 4.1943E-35 |
| **1050** | -6.7376E-34 | ± 5.1846E-35 | 3.0357E-34 | ± 2.6953E-35 |
| **1100** | -2.7857E-34 | ± 6.6347E-35 | 2.3092E-34 | ± 4.3349E-35 |
| **1150** | -1.3201E-34 | ± 5.5265E-35 | 1.9410E-34 | ± 4.8031E-35 |
| **1200** | 2.5404E-34 | ± 5.1289E-35 | 7.9727E-35 | ± 1.4383E-35 |
| **1250** | --- | --- | --- | --- |
| **1300** | 1.2098E-34 | ± 5.9971E-35 | 6.2148E-35 | ± 1.8356E-35 |
| **1350** | -2.5817E-34 | ± 1.9852E-35 | 1.5858E-34 | ± 1.3471E-35 |
| **1400** | -2.5401E-34 | ± 1.9531E-35 | 1.9840E-34 | ± 1.6311E-35 |
| **1450** | 4.2092E-34 | ± 2.5617E-35 | 6.4640E-35 | ± 6.2627E-36 |
| **1500** | 3.6763E-34 | ± 2.0335E-35 | 4.1559E-35 | ± 4.8093E-36 |
| **1550** | 3.0683E-34 | ± 1.4194E-35 | 1.2467E-35 | ± 3.2569E-36 |
| **1600** | 1.6596E-34 | ± 8.9892E-35 | 1.4761E-35 | ± 6.6268E-36 |

**Table S4.** Re (γ) and Im (γ) values for **1-Te**

| Wavelength (nm) | Re (γ) (esu) | error | Im (γ) (esu) | Error |
|---|---|---|---|---|
| **850** | -1.5991E-32 | ± 1.8994E-34 | 1.8281E-33 | ± 3.9522E-35 |
| **900** | -9.8715E-33 | ± 1.8995E-34 | 3.3992E-33 | ± 1.2810E-34 |
| **950** | -6.6772E-33 | ± 1.6082E-34 | 2.0280E-33 | ± 1.0617E-34 |
| **1000** | -3.0667E-33 | ± 2.2408E-34 | 2.2579E-33 | ± 2.6977E-34 |
| **1050** | -3.4158E-33 | ± 7.2700E-35 | 9.8483E-34 | ± 5.5928E-35 |
| **1100** | -2.9073E-33 | ± 8.0462E-35 | 9.8639E-34 | ± 6.5957E-35 |
| **1150** | -2.1331E-33 | ± 1.2029E-34 | 7.2780E-34 | ± 6.0488E-35 |
| **1200** | -3.6965E-34 | ± 1.1786E-34 | 3.7742E-34 | ± 8.2618E-35 |
| **1250** | -1.4449E-34 | ± 1.0024E-34 | 3.3036E-34 | ± 1.0336E-34 |
| **1300** | -9.2090E-34 | ± 1.8682E-34 | 3.3036E-34 | ± 5.6353E-35 |
| **1350** | -5.1634E-34 | ± 3.9687E-35 | 3.1717E-34 | ± 2.6925E-35 |
| **1400** | -5.0801E-34 | ± 3.9046E-35 | 3.9680E-34 | ± 3.2600E-35 |
| **1450** | 3.5505E-35 | ± 3.6276E-35 | 2.3048E-34 | ± 8.2894E-35 |
| **1500** | 3.3079E-34 | ± 5.0641E-35 | 1.9903E-34 | ± 2.8924E-35 |
| **1550** | 2.5975E-34 | ± 5.9120E-35 | 1.2634E-34 | ± 2.5339E-35 |
| **1600** | -3.6852E-34 | ± 2.3003E-34 | 1.2064E-34 | ± 4.2738E-35 |