**Table 1** CD or CPL characteristics reported for chiral six-coordinate pseudo-octahedral Cr(III) complexes at room temperature.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Entry | Complex | Chirality[a] | CD: Δ*ε* (M−1 cm−1) | CPL:  φ(%), τ(ms) | X-ray structure |  | Ref. |
| 1 | [Cr(CN)4(*d*-pn)]  pn = 1,2-propylendiamine | 2.2 | +0.075 (22660 cm-1)  -0.384 (25540 cm-1)  +0.052 (32260 cm-1) | No | No |  | [1] |
| 2 | [Cr(CN)4(*l*-pn)]  pn = 1,2-propylendiamine | 2.2 | -0.081 (22620 cm-1)  +0.383 (25410 cm-1)  -0.059 (30170 cm-1) | No | No |  | [1] |
| 3 | Λ-*cis*-(-)598-[Cr(CN)2(*d*-pn)2]  pn = 1,2-propylendiamine | 2.1, 2.2 | +0.484 (21810 cm-1)  -0.196 (24210 cm-1)  +0.040 (28410 cm-1) | No | Yes[2] |  | [1-2] |
| 4 | *cis*-(-)598-[Cr(CN)2(*l*-pn)2]  pn = 1,2-propylendiamine | 2.1, 2.2 | -0.557 (21880 cm-1)  +0.219 (24240 cm-1)  -0.059 (28330 cm-1) | No | No |  | [1] |
| 5 | *cis*-(+)598-[Cr(CN)2(*d*-pn)(*l*-pn)]  pn = 1,2-propylendiamine | 2.1, 2.2 | +0.580 (23530 cm-1)  -0.045 (29590 cm-1) | No | No |  | [1] |
| 6 | *cis*-(-)598-[Cr(CN)2(*d*-pn)(*l*-pn)]  pn = 1,2-propylendiamine | 2.1, 2.2 | -0.573 (23530 cm-1)  +0.050 (29590 cm-1) | No | No |  | [1] |
| 7 | *cis*-(+)598-[Cr(CN)2(en)2] | 2.1, 2.3 | +0.00065 (14510 cm-1)  -0.00072 (14750 cm-1)  +0.51 (23330 cm-1)  -0.036 (29850 cm-1) | No | No |  | [1, 3] |
| 8 | (-)546-[Cr(en)3]  en = ethylenediamine | 2.1, 2.3 | -0.016 (14950 cm-1)  +0.007 (15250 cm-1)  -0.007 (15550 cm-1)  -1.44 (21750 cm-1) [4] | -0.046 (14900 cm-1)[4] | No |  | [4-5] |
| 9 | (+)546-[Cr(en)3] | 2.1, 2.3 | +0.0089 (15000 cm-1)  -0.0057 (15500 cm-1)  +0.0068 (15800 cm-1)  +1.49 (21900 cm-1)[6] | +0.028 (14880 cm-1)[7] [b]  φ = 0.0065% | Yes[5] |  | [5-7] |
| 10 | (+)546-[Cr(phen)3]  phen = phenantroline | 2.1 | +0.0128 (13800 cm-1)  -0.0077 (14500 cm-1)  +2.48 (21900 cm-1) | No  τ = 0.224 ms | Yes[8] |  | [6, 8] |
| 11 | Δ-[Cr(bpy)3]  bpy = 2,2’-bipyridine | 2.1 | -1.2 (21739 cm-1)  -19.5 (28090 cm-1)  -21 (28818 cm-1)  -75 (31746 cm-1)  +9.5 (34898 cm-1)  +9 (35714 cm-1)  +12 (37879 cm-1)[9] | No | Yes[10] |  | [9-10] |
| 12 | Λ-[Cr(ox)3]  ox = oxalate | 2.1 | Yes | No | Yes[11] |  | [11-12] |
| 13 | Λ-[Cr(mal)3]  Mal = malonate | 2.1 | Yes | No | No |  | [12] |
| 14 | Λ-[Cr(thiox)3]  Thiox = dithioxalate | 2.1 | Yes | No | No |  | [12] |
| 15 | [Cr(Oacac)3]  Oacac = 3-octylpentane-2,4-dionato | 2.1 | *g* = Δ*ε*/*ε* =  -0.04 (18868 cm-1)  +0.025 (15798 cm-1)[13]  −10 (11765 cm-1)  −50 (∼28570 cm-1) [14] | No | No |  | [13-14] |
| 16 | [Cr(3-Buacac)3]  Buacac = 3-butylpentane-2,4-dionato | 2.1 | *g* = Δ*ε*/*ε* =  -0.05 (19048 cm-1)  0.032 (15798 cm-1) [15]  −40 (∼28570 cm-1) [14] | No | No |  | [14-15] |
| 17 | [Cr(Pracac)3]  Pracac = 3-Propylpentane-2,4-dionato | 2.1 | *g*= Δ*ε*/*ε* =  −0.05 (19048 cm-1)  +0.032 (15798 cm-1) | No | No |  | [16] |
| 18 | [Cr(Peacac)3]  Peacac = 3-Pentylpentane-2,4-dionato | 2.1 | *g* = Δ*ε*/*ε* =  −0.05 (19048 cm-1)  +0.032 (15798 cm-1) | No | No |  | [16] |
| 19 | [Cr(en)3][Cr(ox)3] double salt | 2.1, 2.3 | Yes | +0.008 (14131 cm-1 ) | Yes[17] |  | [17-18] |
| 20 | [Cr(pn)3][Cr(ox)3] double salt  pn = 1,3 propylendiamine | 2.1, 2.3 | Yes | No | Yes |  | [18] |
| 21 | (+)546-[Cr(pn)3]  pn = 1,3 propylendiamine | 2.1, 2.3 | +0.0022 (15100 cm-1)  -0.0005 (15600 cm-1)  +0.0011 (15900 cm-1)  +0.34 (20900 cm-1) | No | No |  | [6] |
| 22 | (+)546-[Cr(ox)2(en)] | 2.1, 2.3 | +0.0075 (14500 cm-1)  -0.00103 (14900 cm-1)  +0.00113 (15300 cm-1)  -0.05 (16800 cm-1)  +2.00 (19400 cm-1) | No | Yes[17] |  | [6, 17] |
| 23 | (+)589-[Cr(ox)2(bpy)] | 2.1 | +0.0045 (13900 cm-1)  -0.0054 (14300 cm-1)  -0.0066 (14500 cm-1)  +0.0017 (14800 cm-1)  -0.12 (17000 cm-1)  +2.22 (19500 cm-1) | No | No |  | [6] |
| 24 | (+)546-[Cr(ox)2(phen)] | 2.1 | +0.032 (13900 cm-1)  -0.0030 (14400 cm-1)  +0.027 (14700 cm-1)  -0.135 (16400 cm-1)  +2.46 (19000 cm-1) | No | No |  | [6] |
| 25 | (+)546-[Cr(ox)(en)2] | 2.1, 2.3 | +0.0129 (14700 cm-1)  -0.0064 (15200 cm-1)  +0.0114 (15500 cm-1)  +1.97 (20800 cm-1) | No | No |  | [6] |
| 26 | (+)546-[Cr(ox)(bpy)2] | 2.1 | +0.0056 (13600 cm-1)  -0.0017 (14000 cm-1)  -0.0030 (14300 cm-1)  +0.0020 (14900 cm-1)  -0.06 (17800 cm-1)  +1.40 (20600 cm-1) | No | No |  | [6] |
| 27 | (+)589-[Cr(ox)(phen)2] | 2.1 | +0.0046 (13800 cm-1)  -0.0062 (14800 cm-1)  -0.84 (18400 cm-1)  +1.50 (21200 cm-1) | No | No |  | [6] |
| 28 | (-)589- [Cr(ox)(bpy)(phen)] | 2.1 | -0.0052 (13600 cm-1)  +0.0021 (14300 cm-1)  -1.76 (20500 cm-1) | No | No |  | [6] |
| 29 | (-)589-[Cr(biguanide)3] | 2.1 | -0.008 (13100 cm-1)  +0.004 (14100 cm-1)  -2.78 (19200 cm-1)  +4.16 (21700 cm-1) | No | No |  | [6] |
| 30 | (+)546-[Cr(acac)(en)2]  acac = acetylacetonate | 2.1, 2.3 | +0.010 (13800 cm-1)  -0.0013 (14200 cm-1)  +0.077 (15200 cm-1)  +2.75 (21100 cm-1) | No | No |  | [6] |
| 31 | (+)546-[Cr(acaCl)(en)2]  acaCl = 3-chloroacetylacetonato | 2.1, 2.3 | +0.0078 (13700 cm-1)  -0.0032 (14200 cm-1)  +0.069 (15100 cm-1)  +2.62 (21100 cm-1) | No | No |  | [6] |
| 32 | (+)546-[Cr(acaBr)(en)2  acaBr = 3-bromoacetylacetonato | 2.1, 2.3 | +0.0054 (13700 cm-1)  -0.0056 (14200 cm-1)  +0.048 (15200 cm-1)  +2.38 (21200 cm-1) | No | No |  | [6] |
| 33 | (+)546-[Cr(acac)2(en)] | 2.1, 2.3 | -0.0119 (12900 cm-1)  +0.056 (13900 cm-1)  -0.0224 (14400 cm-1)  -0.84 (17700 cm-1)  +4.00 (20100 cm-1) | No | No |  | [6] |
| 34 | (+)546-[Cr(acac)(acaBr)(en)] | 2.1, 2.3 | -0.0139 (12700 cm-1)  +0.0483 (13800 cm-1)  -0.0543 (14400 cm-1)  -0.84 (17700 cm-1)  +3.59 (20100 cm-1) | No | No |  | [6] |
| 35 | (+)546-[Cr(acaBr)2(en)] | 2.1, 2.3 | -0.88 (17300 cm-1)  +4.40 (20200 cm-1) | No | No |  | [6] |
| 36 | (+)546-[Cr(acaCl)2(en)] | 2.1, 2.3 | -0.0252 (12600 cm-1)  +0.0545 (13700 cm-1)  -0.0603 (14500 cm-1)  -0.86 (17700 cm-1)  +4.21 (20200 cm-1) | No | No |  | [6] |
| 37 | Δ-(-)-[Cr(en)3]3+ doped in 2[Rh(en)3CI3]∙NaCl∙6H2O | 2.1, 2.3 | Yes | -0.19 (14900 cm-1) | Yes | 10 % Doped crystal | [19] |
| 38 | (+)589-[Cr(gly)(en)2]  gly = glycine | 2.1, 2.3 | +0.00777 (14810 cm-1)  -0.00158 (15150 cm-1)  +0.00604 (15580 cm-1)  +1.91 (21460 cm-1)  -0.16 (27550 cm-1)  +0.04 (30450 cm-1) | No | No |  | [20] |
| 39 | (+)589-[Cr(L-ala)(en)2]  ala = alanine | 2.1, 2.2, 2.3 | +0.00664 (14770 cm-1)  -0.00125 (15280 cm-1)  +0.00270 (15570 cm-1)  +1.65 (21150 cm-1)  -0.12 (27700 cm-1)  +0.04 (30400 cm-1) | No | No |  | [20] |
| 40 | (+)589-[Cr(phala)(en)2]  phala = phenylalanine | 2.1, 2.2, 2.3 | +0.00725 (14750 cm-1)  -0.00118 (15200 cm-1)  +0.00385 (15520 cm-1)  +1.70 (21100 cm-1)  -0.16 (27620 cm-1)  +0.03 (30530 cm-1) | No | No |  | [20] |
| 41 | *Λ*-*fac*-[Cr(L-ala)3] | 2.1, 2.2 | Yes | -0.021 (14185 cm-1)[c] | No |  | [21] |
| 42 | [Cr(D-ala)3] | 2.1, 2.2 | Yes | +0.024 (14185 cm-1)[c] | No |  | [21] |
| 43 | (+)598-[Cr(*d*-pn)3]  pn = 1,2-propylendiamine | 2.1, 2.2 | +1.805 (21230 cm-1)  -0.040 (24390 cm-1)  +0.095 (27400 cm-1)  +0.103 (29670 cm-1) | No | No |  | [1] |
| 44 | (-)598-[Cr(*l*-pn)3]  pn = 1,2-propylendiamine | 2.1, 2.2 | -1.792 (21230 cm-1)  +0.041 (24390 cm-1)  -0.098 (27250 cm-1)  -0.112 (29410 cm-1) | No | No |  | [1] |
| 45 | *Δ*-(+)589-[Cr{(-)(*R*,*R*)bdtp}3]  bdtp = cyclo- O,O’1(R), 2(R)-dimethyl-ethylene dithiophosphato | 2.1, 2.2 | Yes | No | Yes |  | [22] |
| 46 | *Λ*-(-)-[Cr{(+)-(*S*)(*S*)-Mebdtp}3]  Mebdtp = O, O’-[bis(2-methylbutyl)]dithiophosphato | 2.1, 2.2 | Yes | No | No |  | [23] |
| 47 | (*M*,*M*)-[Cr(ddpd)2]  ddpd = N,N’-dimethyl-N,N’-dipyridine-2-yl-pyridine-2,6-diamine | 2.3 | Yes  Maximum at 300nm | -0.093 (12900 cm-1)  φ = 11% ; τ = 0.889 ms | Yes |  | [24] |
| 48 | (*P*,*P*)-(+)-[Cr(dqp)2]  dqp = 2,6-di(quinolin-8-yl)pyridine | 2.3 | ∼90 (31447 cm-1)  ∼110 (24155 cm-1) | +0.2 (13351 cm-1)  -0.1 (13736 cm-1)  φ = 5.1% ; τ =1.2 ms | Yes |  | [25] |
| 49 | (*P*,*P*)-[Cr(dqpOMe)2]  dqpOMe = 4-methoxy-2,6-di(quinolin-8-yl)pyridine | 2.3 | ∼90 (∼30300 cm-1)  ∼100 (∼25000 cm-1) | +0.18 (13228 cm-1)  -0.08 (13831 cm-1)  φ = 17% ; τ =1.35 ms | Yes |  | [26] |
| 50 | (*P*,*P*)-[Cr(dqpBr)2]  dqpBr = 4-bromo-2,6-di(quinolin-8-yl)pyridine | 2.3 | ∼90 (∼30300 cm-1)  ∼100 (∼24400 cm-1) | +0.19 (13316 cm-1)  -0.07 (13870 cm-1)  φ = 14% ; τ = 1.23 ms | Yes |  | [27] |
| 51 | (*P*,*P*)-[Cr(dqpC≡CH)2]  dqpC≡CH = 4-Alkyne-2,6-di(quinolin-8-yl)pyridine | 2.3 | ∼110 (∼30300 cm-1)  ∼100 (∼24400 cm-1) | +0.17 (13280 cm-1)  -0.06 (13850 cm-1)  φ = 15% ; τ = 1.33 ms | Yes |  | [27] |
| 52 | *Λ*-(-)598-*trans-*(O5O6)-[Cr(eda3p)]  eda3p = ethylenediamine-N-acetato-N,N’,N’-tri-3-propionate | 2.3 | +0.09 (16580 cm-1)  -0.64 (18760 cm-1)  -0.14 (21050 cm-1)  +0.07 (23530 cm-1)  +0.23 (26670 cm-1) | No | No |  | [28] |
| 53 | *Λ*-(-)598-*trans-*(O5)-[Cr(eddda)]  Eddda = Ethylenediamine-N,N’-diacetato-N,N’-dipropionate | 2.3 | +0.0352 (14250 cm-1)  -0.0092 (14870 cm-1)  +0.0780 (15260 cm-1)  +0.207 (16530 cm-1)  -0.765 (18620 cm-1)  -0.19 (20330 cm-1)  -0.05 (22170 cm-1)  -0.075 (24100 cm-1)  +0.23 (26530 cm-1) | No | No |  | [29] |
| 54 | *Λ*-(+)598-*trans-*(O5)-[Cr(*S*,*S*-edds)]  S,S-edds = (S,S)-2,2’-(ethylenediimino) disuccinate | 2.2, 2.3 | +0.0348 (14210 cm-1)  -0.0024 (14380 cm-1)  +0.0036 (14530 cm-1)  -0.0120 (14870 cm-1)  +0.0690 (15440 cm-1)  +0.409 (17540 cm-1)  -0.396 (19330 cm-1)  +0.453 (21830 cm-1)  +0.33 (23330 cm-1)  +0.386 (27030 cm-1) | No | No |  | [29] |
| 55 | Λ-(+)598-[Cr(S,S-ptnta)]  S,S-ptnta = (2S,4S)-2,4-pentanediamine tetraacetate | 2.2, 2.3 | -0.0038 (13920 cm-1)  +0.0055 (14350 cm-1)  +0.0058 (14460cm-1)  -0.0017 (14620 cm-1)  +0.0014 (14620 cm-1)  -0.0021 (15000 cm-1)  +0.0260 (15310 cm-1)  +0.2 (18000 cm-1)  +0.442 (19670 cm-1)  -0.064 (21670 cm-1)  +0.435 (24000 cm-1)  +0.27 (25250 cm-1)  -0.024 (29660 cm-1) | No | No |  | [29a] |
| 56 | (-)589-[Cr2(OH)2(bpy)2(phen)2] | 2.1 | -0.0766 (13700 cm-1)  -0.0920 (14100 cm-1)  +0.0083 (15500 cm-1)  -6.82 (18700 cm-1) | No | No |  | [6] |
| 57 | [Cr2(l-tart2H)(bpy)2]  l-tart= L-tartrate | 2.1, 2.2 | Yes | No | No |  | [30] |
| 58 | [Cr2(l-tart2H)(phen)2] | 2.1, 2.2 | Yes | No | Yes |  | [30-31] |
| 59 | [Cr2(OH)2(L-ala)4] | 2.1, 2.2 | Yes | Yes[c] | No |  | [20] |
| 60 | *M*-(+)589-[Cr(L)3]3+  L = | 2.1 | -22 (31750 cm-1)  +48 (29070 cm-1)  +1.8 (21500 cm-1) | No | No |  | [32] |
| 61 | *(M*,*M*)-(-)589-[LnCr(L)3]6+ Ln = Eu, Gd, Tb | 2.1 | -74 (29410 cm-1) | +0.01 (13423 cm-1)  +0.07 (16234 cm-1)  (identical for all Ln) | Yes for Eu | Colour code: Orange = Cr, Sky blue = Eu, Red = O, Purple = N, Grey = C. Hydrogens are omitted for clarity | [32] |
| 62 | (*Λ*)- and (*Δ*)-[(acac)2Cr(ox)Ln(HBpz3)2]  Ln= Yb, Dy, Sm, Ho, Er  HBpz3- = hydrotris(pyrazol-1-yl)borato | 2.1 | Yes | No | Yes for Yb, Sm, Ho and Er | Ln = Yb, Dy, Sm, Ho, Er | [33] |

[a] Type of chirality defined in sections 2.1, 2.2 and 2.3. [b] Measurement done in a solid at 195 K, [c] Measurement done at 77 K. The quantum yields (φ) and excited-state lifetimes (τ) were measured in deaerated solutions

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