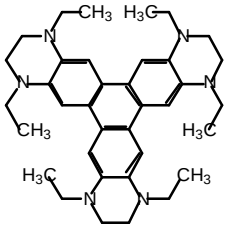
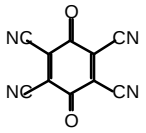
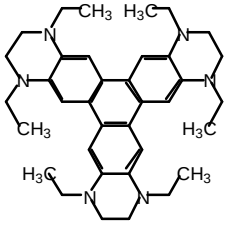
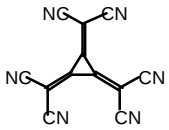
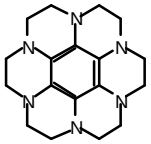
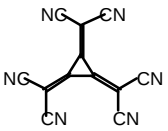
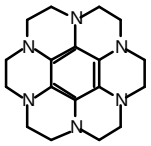
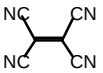
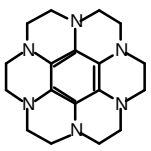
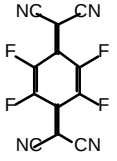
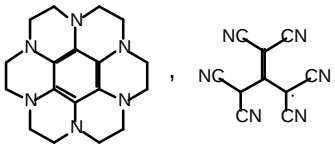
2-2. 電荷移動錯体、イオンラジカル塩、フラーレン錯体

(電荷移動錯体)

ドナー, アクセプター	備考	文献
 , 	D : A = 1 : 1 ΔEST = 0.6 kcal/mol	R1, R2
 , 	**混合法** D : A = 1 : 1 **反強磁性**	R3
 , 	**混合法** D : A = 1 : 1 ΔEST = 3.7 kcal/mol	R4
 , 	**混合法** D : A = 1 : 1 P1 μeff = 2.48 μ B θ= -49.7 K	R4
 , 	**混合法** D : A = 1 : 1 ΔEST = 3.7 kcal/mol	R4

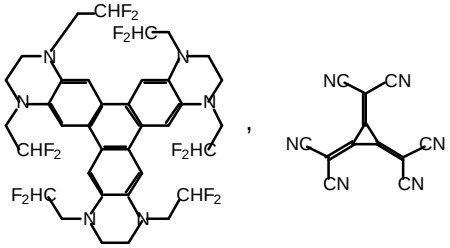


混合法 R4

D : A = 1 : 1

P_{212121}

ΔEST = 3.7 kcal/mol

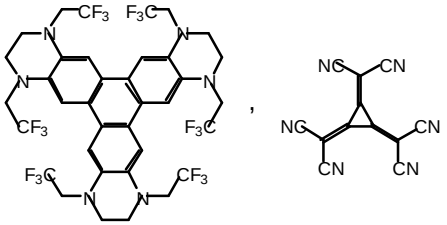


混合法 R5

D : A = 1 : 1

反強磁性

C = 0.072 emu/mol

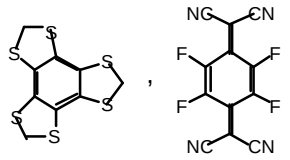


混合法 R5

D : A = 1 : 1

反強磁性

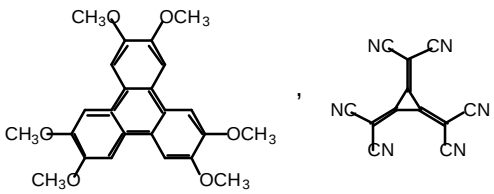
C = 0.053 emu/mol



混合法 R6

D : A = 1 : 1

常磁性



拡散法 R7

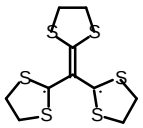
D : A = 1 : 1

P_{3c1} - C_{33v}

反強磁性

C = 0.121 emu/mol

θ = -14 K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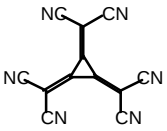
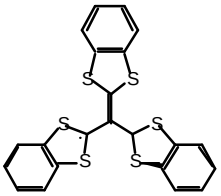


拡散法 R8

D : A = 1 :1

強磁性?

0.006% spin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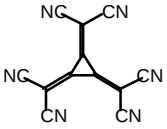
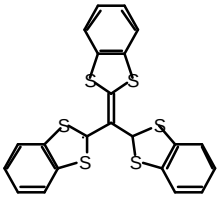


拡散法 R8

D : A = 1 : 1

強磁性?

0.3 spin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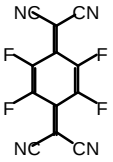
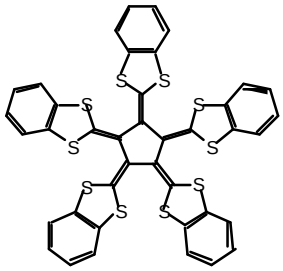


拡散法 R8

D : A = 1 : 1

強磁性?

5.9% spin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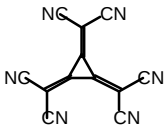
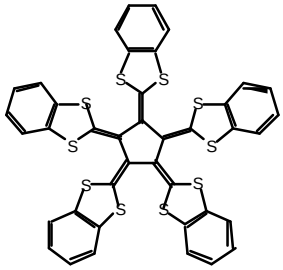


混合法 R9

D : A = 1 : 2

反磁性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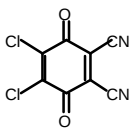
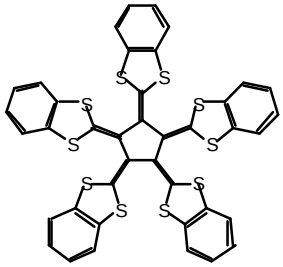
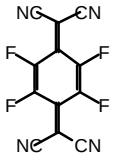
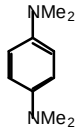
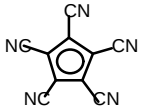
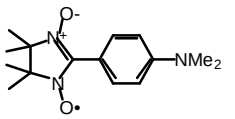
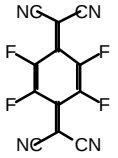
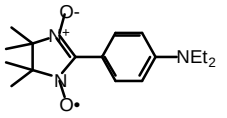
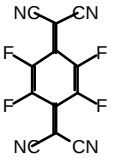
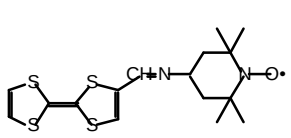
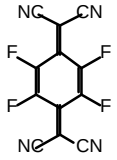
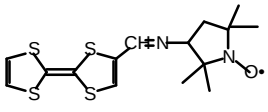
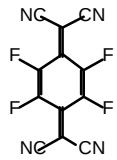
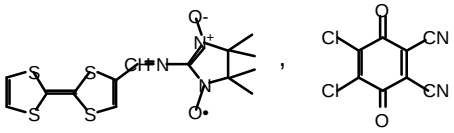
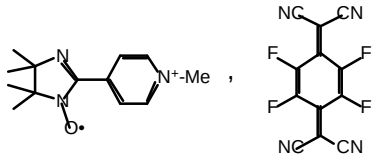
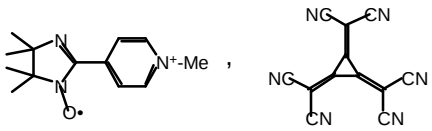
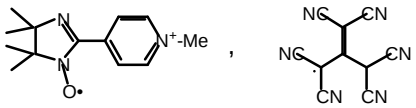
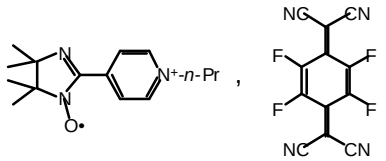
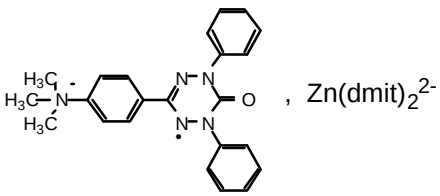


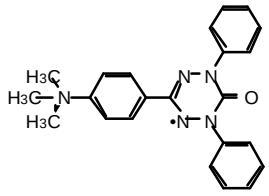
混合法 R9

D : A = 1 : 2

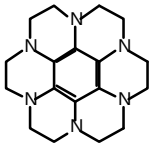
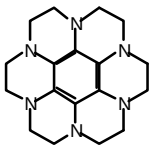
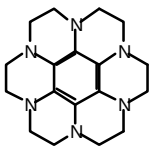
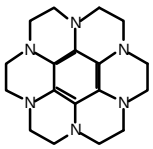
反強磁性

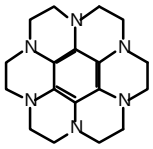
 , 	**混合法** D : A = 1 : 4 **反強磁性**	R9
 , 	**再結晶** D : A = 1 : 1 **反強磁性** θ = -2.6 K	R10
 , 	**混合法** D : A = ? J/kB = -310 K	R11
 , 	**混合法** D : A =? J/kB = -330 K	R11
 , 	**混合法** D : A = 1 : 1 J/kB = -750 K ΔEST = 2 kcal/mol	R11, R12, R13
 , 	**混合法** D : A = 1 : 1 ΔEST = 610 cal/mol	R12, R13

	**混合法** **常磁性**	R14
	**混合法** D : A = 1 : 1	R15
	**混合法** D : A = 1 : 1 P21/n Tc = 0.4 K 0.5 μ B θ < 20 K	R16, R17
	**混合法** D : A = 1 : 1 Tc = 0.4 K θ < 20 K	R16, R17
	**混合法** D : A = 1 : 1 Tc = 0.55 K θ < 20 K	R16, R17
	**混合法** D : A = 2 : 1 Tmax = 3 K J1/kB = -2.4 K	R18

 , $Ni(dmit)_2^-$	**混合法** D : A = 1 : 1 Tmax = 6.4 K J/kB = -5.0 K	R18

(**イオンラジカル塩**)

ドナー, アクセプター	**備考**	**文献**
 , PF_6^-	**化学酸化** D : A = 1 : 1 Ibam **μ**eff = 1.76 **μ**B θ = -2 K	R4
 , PF_6^-	**化学酸化** D : A = 1 : 2 P21/n **Δ**EST = 3.4 kcal/mol	R4
 , PF_6^-	**化学酸化** D : A = 1 : 2 **Δ**EST > 4.0 kcal/mol	R4
 , PF_6^-	**化学酸化** D : A = 1 : 3 C2/m **μ**eff = 1.68 **μ**B θ = 0.2 K	R4



, SbF_6^-

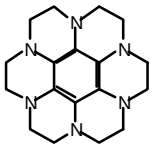
化学酸化 R4

D : A = 1 : 3

R3m

μeff = 1.72 **μ**B

θ = -1.7 K

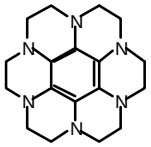


, SbF_6^-

化学酸化 R4

D : A = 1 : 2

ΔEST > 4.0 kcal/mol



, AsF_6^-

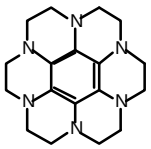
化学酸化 R4

D : A = 1 : 1

P21/c

μeff = 1.76 **μ**B

θ = -3.4 K

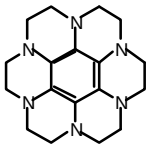


, $CF_3SO_3^-$

化学酸化 R4

D : A = 1 : 2

ΔEST > 4.0 kcal/mol



, $CF_3SO_3^-$

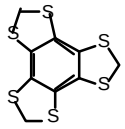
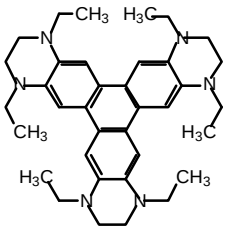
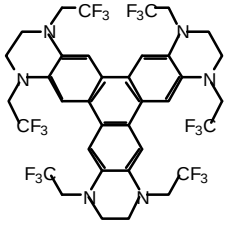
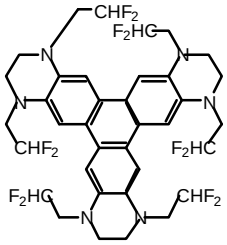
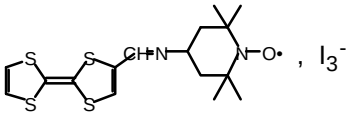
電解酸化 R6

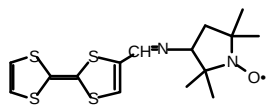
D : A = 2 : 1

反強磁性

C = 0.25 emu/mol

θ = -33 K

 , BF_4^-	D : A = 1 : 1 **反強磁性** T(χ max) = 200 K	R19
 , BPh_4^-	D : A = 1 : 1 **反強磁性** T(χ max) = 50 K	R19
 , PF_6^-	D : A = 1 : 1 **反強磁性** T(χ max) θ < 6 K	R19
 , PF_6^-	D : A = 1 : 1 ΔEST > 3 kcal/mol	R12, R13
 , I_3^-	I_2 **酸化** D : A = 1 : 1 ΔEST > 3 kcal/mol	R12, R13

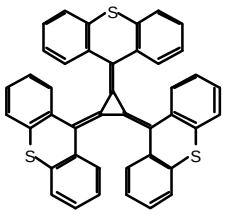


, I_3^-

I_2 **酸化** R12, R13

D : A = 1 : 1

⊿EST = 320 cal/mol



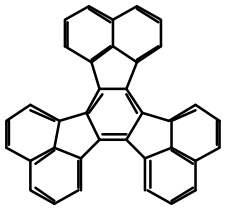
, $CF_3CO_2^-$

化学酸化 R20

D : A = 1 : 1

反強磁性

⊿EST >0.7 eV



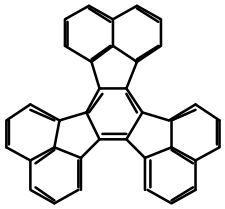
, BF_4^-

電解酸化 R21

D : A = 3 : 2

反強磁性

T(**χ** max) = 250 K



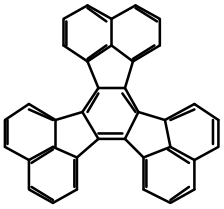
, PF_6^-

電解酸化 R21

D : A = 3 : 2

反強磁性

T(**χ** max) = 150 K



, SbF_6^-

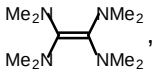
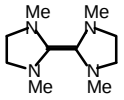
電解酸化 R21

D : A = 3 : 2

反強磁性

T(**χ** max) = 150 K

(**フラーレン錯体**)

ドナー，アクセプター	備考	文献
	**混合法** D : A = 1 : 1 Tc = 16.1 K 0.33 μB	R22, R23
	**混合法** D : A = ? Tc > 140 K > 0.001 emu/g θ = 1000 K	R23

REFERENCES

(R1) R. Breslow, *Pure Appl. Chem.*, **54**, 927 (1982).

(R2) R. Breslow, B. Jaun, R. Klutz and C.-Z. Xia, *Tetrahedron*, **38**, 863 (1982).

(R3) R. Breslow, *Mol. Cryst. Liq. Cryst.*, **125**, 261 (1985).

(R4) J. S. Miller, D. A. Dixon, J. C. Calabrese, C. Vazquenz, P. J. Krusic, M. D. Ward, E. Wasserman and R. L. Harlow, *J. Am. Chem. Soc.*, **112**, 381 (1990).

(R5) T. Lepage and R. Breslow, *J. Am. Chem. Soc.*, **109**, 6412 (1987).

(R6) J. P. Morand, L. Brezezinski, R. Lapouyade, J. Amiell and P. Delhaes, *Mol. Cryst. Liq. Cryst.*, **156**, 237 (1988).

(R7) L. Y. Chiang, R. B. Upasani, D. P. Goshorn and J. W. Swirczewski, *Chem. Mater.*, **4**, 394 (1992).

(R8) T. Sugimoto, E. Murahashi, K. Ikeda, Z. Yoshida, H. Nakatsuji, J. Yamauchi, Y. Kai and N. Kasai, *Mat. Res. Soc. Symp. Proc.*, **247**, 417 (1992).

(R9) T. Sugimoto, Y. Misaki, Z. Yoshida, and J. Yamauchi, *Mol. Cryst. Liq. Cryst.*, **176**, 259 (1989).
Z. Yoshida, T. Sugimoto, and Y. Misaki, *Mat. Res. Soc. Symp. Proc.*, **173**, 3 (1990).

(R10) T. P. Radhakrishnan, Z. G. Soos, H. Endres and L. J. Azeredo, *J. Chem. Phys.*, **85**, 1126 (1986).

(R11) T. Sugano, T. Fukasawa and M. Kinoshita, *Synth. Met.*, **41-43**, 3281 (1991).

(R12) T. Sugimoto, S. Yamaga, M. Nakai, K. Ohmori, M. Tsujii, H. Nakatsuji, H. Fujita, and J. Yamauchi, *Chem. Lett.*, 1993, 1361.

(R13) T. Sugimoto, S. Yamaga, M. Nakai, M. Nakatsuji, and N. Hosoito, *Chem. Lett.*, 1993, 1817.

(R14) R. Kumai, A. Izuoka and T. Sugawara, *Mol. Cryst. Liq. Cryst.*, **232**, 151 (1993).

(R15) Y. Nakamura, N. Koga and H. Iwamura, *Chem. Lett.*, 1991, 69.

(R16) T. Sugimoto, M. Tsujii, E. Murahashi, H. Nakatsuji, J. Yamauchi, H. Fujita, Y. Kai and N. Kasai, *Mol. Cryst. Liq. Cryst.*, **232**, 117 (1993).

(R17) T. Sugimoto, M. Tsujii, T. Suga, H. Matsuura, N. Hosoito, N. Takeda, M. Ishikawa and M. Shiro, *Technical Report of ISSP, Ser. A*, No. 2854 (1994): *Mol. Cryst. Liq. Cryst.* **272**, 183 (1995).

(R18) **仙波伸得、東長雄、向井和男、植田一正、杉本豊成、**1999 **分子構造総合討論会要旨集、**609 (1999).

(R19) T. Lepage and R. Breslow, *J. Am. Chem. Soc.* **109**, 6412 (1987).

(R20) T. Sugimoto, Y. Misaki, T. Kajita, T. Nagatomi, and Z. Yoshida, *Angew Chem. Int. Ed. Engl.*, **27**, 1078 (1988).

(R21) J. B. Torrance, P. S. Bagus, I. Johannsen, A. I. Nazzal, and S.S.P. Parkin, *J. Appl. Phys.*, **63**, 2962 (1988); P. S. Bagus and J. B. Torrance, *Phys. Rev. B*, **39**, 7301 (1989).

(R22) P.-M. Allemand, K. C. Khemani, A. Koch, F. Wudl, K. Holczer, S. Donovan, G. Gruner and J. D. Thompson, *Science*, **253**, 301 (1991).

(R23) P. W. Stephens, D. Cox, J. W. Lauher, L. Mihaly, J. B. Wiley, P.-M. Allemand, A. Hirsh, K. Holczer, Q. Li, J. D. Thompson and F. Wudl, *Nature* **355**, 331 (1992).

(R24) H. Wang and D. Zhu, *J. Phys. Chem. Solids* **55**, 437 (1994).