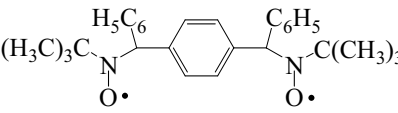
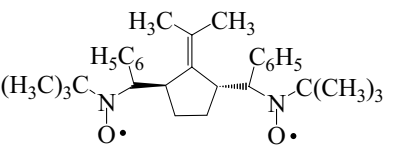


Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
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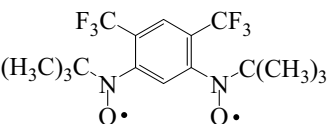
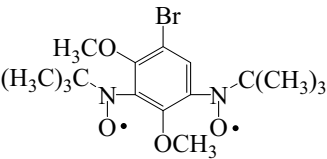
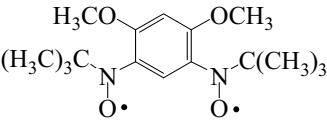
## 12.5 Polynitroxides

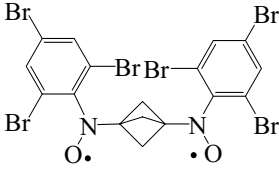
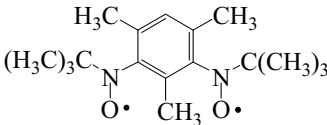
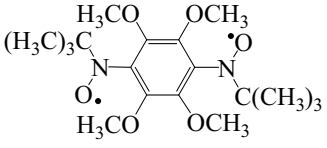
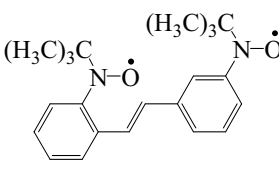
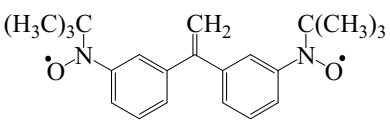
### 12.5.1 Bisnitroxides

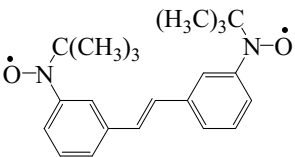
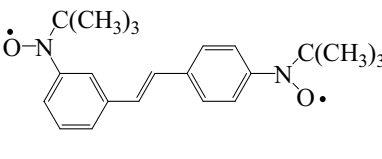
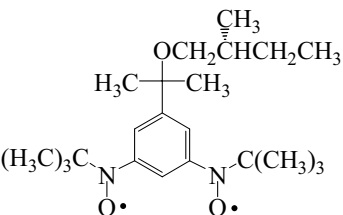
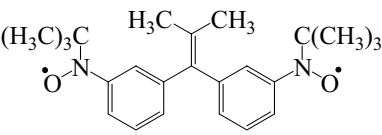
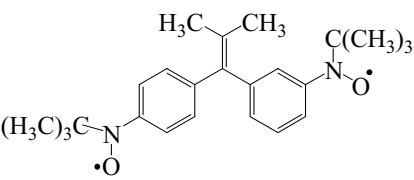
#### 12.5.1.1 Bis(dialkylnitroxides)

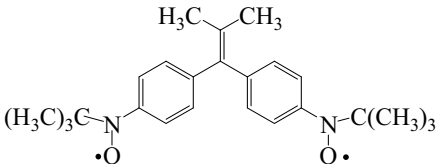
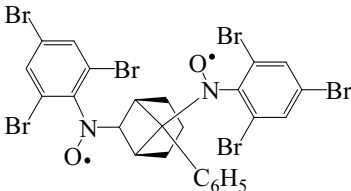
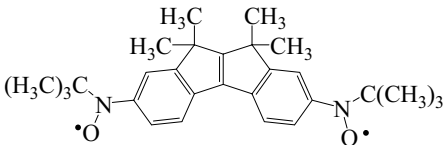
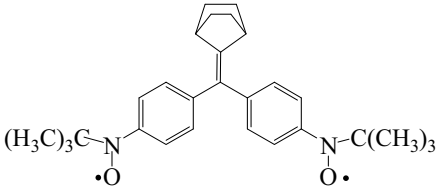
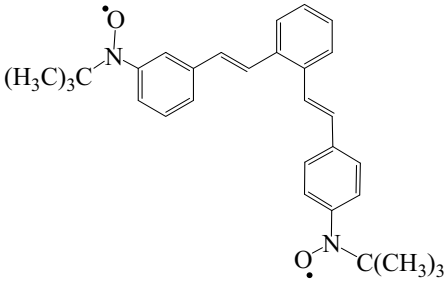
$[C_{28}H_{34}N_2O_2]$ 	Synthesis described Water  Ethyl acetate ESR	Triplet of doublets N: 1.63 H <sub>B</sub> : 0.36 Quintet N: 1.48	96Rez1
$[C_{30}H_{42}N_2O_2]$ 	Thermolysis of 7-isopropylidene-2,3-diazabicyclo-[2.2.1]hept-2-ene in the presence of PBN ACN ESR / 343 to 363	Triplet of doublets 2.0058 N: 1.49 H <sub>B</sub> : 0.20 $J \ll a_N$	91Hwa1

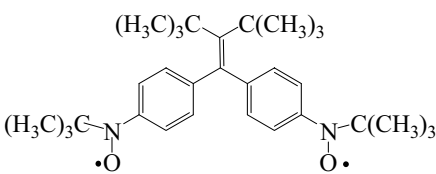
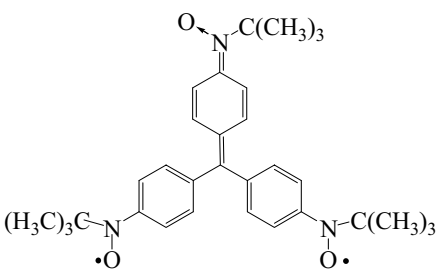
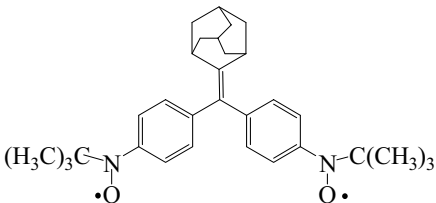
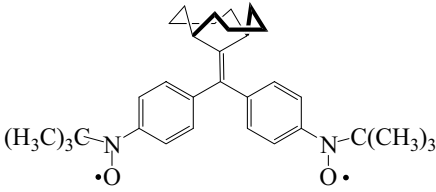
#### 12.5.1.2 Bis(alkyl-arylnitroxides)

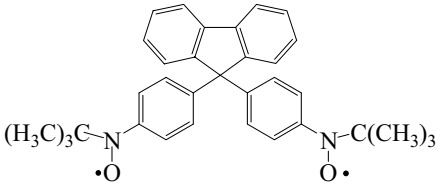
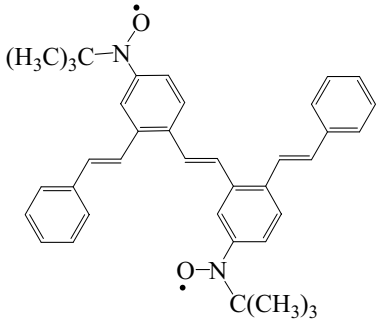
$[C_{16}H_{20}F_6N_2O_2]$ 	Synthesis described MTHF ESR / 5	Complex spectrum $D$ : 0.015 $E$ : 0.001	99Raj1
$[C_{16}H_{25}BrN_2O_4]$ 	Toluene ESR / 6.5	2.0058, 4.014 ( $\Delta m_s = 2$ ) $D$ : 0.016 $E$ : $\approx 0.0$ $J/k_B$ : -39.65 K	96Fuj1
$[C_{16}H_{26}N_2O_4]$ 	Synthesis described Toluene ESR / 296   ESR / 17	Conformer I Single line, $\Delta H_{pp} \approx 3.60$ $J \sim a_N$ Conformer II N: 1.42 $J \ll a_N$ 2.0068 $D$ : 0.0179 $E$ : $\approx 0.0008$	93Kan1

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
$[C_{17}H_{10}Br_6N_2O_2]$ 	Reaction of TBNB with tricyclo[1.1.1.0]pentane Benzene ESR	N: 1.182 $J \ll a_N$	89Vas1
$[C_{17}H_{28}N_2O_2]$ 	Synthesis described Ethanol ESR / 10 ESR / 100  ESR / 10  ESR / 100	<i>Isomer I</i> $2D: \sim 39.0$ mT  $2D: \sim 37.9$ mT $2J/k_B: -75.5$ K  <i>Isomer II</i> $2D: \sim 36.0$ mT  $2D: \sim 38.0$ mT $2J/k_B: -865.0$ K	92Dvo1, 92Dvo2
$[C_{18}H_{30}N_2O_6]$ 	Synthesis described Toluene ESR / 298  Frozen toluene ESR / 10 to 100	Broad, poorly resolved quintet 2.006 N: 1.36  $D: 0.013$	98Nak1, 98Nak2
$[C_{22}H_{28}N_2O_2]$ 	Synthesis described Benzene ESR / 298  Toluene ESR / 77  PM3 geometry of diradical computed.	Five lines spectrum 2.006 N: $\sim 1.2$ to $1.4$ $J > a_N$  Broad slightly-structured spectrum consistent with a weak dipolar interaction	93Nis1, 94Yos1
$[C_{22}H_{28}N_2O_2]$ 	Synthesis described $CH_2Cl_2$ ESR / 298  Toluene ESR / 5 to 10	Five lines spectrum 2.0056 N: 1.26 $J > a_N$  Broad slightly-structured spectrum consistent with a weak dipolar interaction $2D < 9.0$ mT	92Mat1

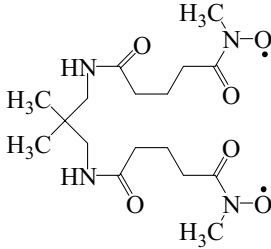
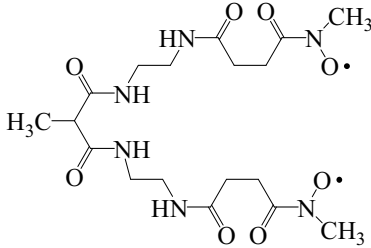
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [ $\text{cm}^{-1}$ ], $E$ [ $\text{cm}^{-1}$ ], $J$ [mT]	Ref. / add. Ref.
$[\text{C}_{22}\text{H}_{28}\text{N}_2\text{O}_2]$ 	Synthesis described Benzene ESR / 298  Toluene ESR / 77	Five lines spectrum 2.006 N: $\sim 1.2$ to $1.4$ $J > a_N$  Broad slightly-structured spectrum consistent with a weak dipolar interaction	94Yos1
PM3 geometry of diradical computed.			
$[\text{C}_{22}\text{H}_{28}\text{N}_2\text{O}_2]$ 	Synthesis described Benzene ESR / 298  Toluene ESR / 77	Five lines spectrum 2.006 N: $\sim 1.2$ to $1.4$ $J > a_N$  Broad slightly-structured spectrum consistent with a weak dipolar interaction	94Yos1
PM3 geometry of diradical computed.			
$[\text{C}_{22}\text{H}_{38}\text{N}_2\text{O}_3]$ 	Synthesis described $\text{CH}_2\text{Cl}_2$ ESR / 298	2.0055 N: 1.31	99Kum1, 99Kum2
$[\text{C}_{24}\text{H}_{32}\text{N}_2\text{O}_2]$ 	Synthesis described Toluene ESR / 298  Toluene ESR / 5 to 10	Five lines spectrum 2.0055 N: 1.12 $J > a_N$  Broad slightly-structured spectrum consistent with a weak dipolar interaction $2D < 9.0$ mT	92Mat1
$[\text{C}_{24}\text{H}_{32}\text{N}_2\text{O}_2]$ 	Synthesis described Toluene ESR / 298  Toluene ESR / 5 to 10	Five lines spectrum 2.006 N: 1.24 $J > a_N$  Broad slightly-structured spectrum consistent with a weak dipolar interaction $2D < 9.0$ mT	92Mat1

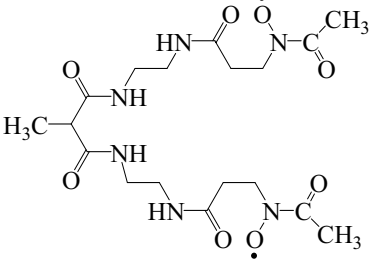
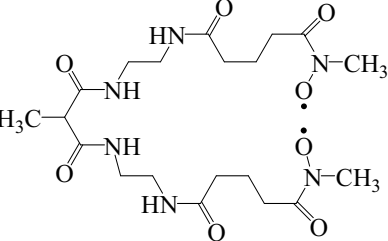
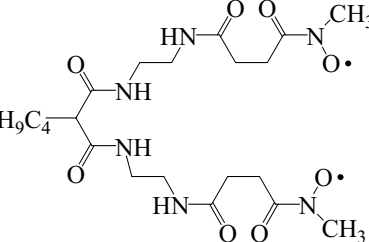
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [ $\text{cm}^{-1}$ ], $E$ [ $\text{cm}^{-1}$ ], $J$ [mT]	Ref. / add. Ref.
$[\text{C}_{24}\text{H}_{32}\text{N}_2\text{O}_2]$ 	Synthesis described Toluene ESR / 298  Toluene ESR / 5 to 77  Molecular Mechanics calculations reported.	Five lines spectrum 2.006 $N$ : 1.19 $J > a_N$  $D$ : 0.0042	92Mat1, 99Shu1
$[\text{C}_{25}\text{H}_{18}\text{Br}_6\text{N}_2\text{O}_2]$ 	Reaction of 1-phenyltri- cyclo[4.1.0]heptane with TBNB Benzene ESR / 293	Complex spectrum $N$ : 1.10 $N$ : 1.19 $H_\beta$ : 0.55	90Vas1
$[\text{C}_{28}\text{H}_{36}\text{N}_2\text{O}_2]$ 	Synthesis described Toluene ESR / 298  Toluene ESR / 77  Molecular Mechanics calculations reported.	$N$ : 1.204 $H_o$ : 0.194 $H_o$ : 0.232 $H_m$ : 0.100 $J > a_N$  $D$ : 0.0035	99Shu1
$[\text{C}_{28}\text{H}_{36}\text{N}_2\text{O}_2]$ 	Synthesis described Toluene ESR / 298  Toluene ESR / 77  Molecular Mechanics calculations reported.	$N$ : 1.190 $4H_o$ : 0.202 $4H_m$ : 0.126 $J > a_N$  $D$ : 0.0035	99Shu1
$[\text{C}_{30}\text{H}_{34}\text{N}_2\text{O}_2]$ 	Oxidation of correspon- ding hydroxylamines with $\text{Ag}_2\text{O}$ or $\text{PbO}_2$ Benzene ESR / 298  Toluene glass ESR / 77	Five lines spectrum 2.006 $N$ : 1.3 $J \gg a_N$  Broad slightly-structured spectrum	95Kan1, 96Nis1

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>30</sub>H<sub>44</sub>N<sub>2</sub>O<sub>2</sub>]</p> 	<p>Synthesis described Toluene ESR / 298</p> <p>Toluene ESR / 77</p>	<p>N: 1.164 4H<sub>o</sub>: 0.274 4H<sub>m</sub>: 0.126 <math>J &gt; a_N</math> <math>D</math>: 0.0064</p>	99Shu1
<p>[C<sub>31</sub>H<sub>39</sub>N<sub>3</sub>O<sub>3</sub>]</p> 	<p>Synthesis described MTHF ESR / 298</p>	<p>Spectrum attributed to the simultaneous presence of two species <i>Species I</i> 2.0041 N: 1.260 N: 0.085 (nitron) 2H<sub>o</sub>: 0.168 2H<sub>m</sub>: 0.084 <math>J \gg a_N</math> <i>Species II</i> 2.0041 N: 1.240 N: 0.084 (nitron) 2H<sub>o</sub>: 0.168 2H<sub>m</sub>: 0.084 <math>J \ll a_N</math></p>	96Oni1
<p>[C<sub>31</sub>H<sub>40</sub>N<sub>2</sub>O<sub>2</sub>]</p> 	<p>Synthesis described Toluene ESR / 298</p> <p>Toluene ESR / 77</p>	<p>N: 1.198 4H<sub>o</sub>: 0.220 4H<sub>m</sub>: 0.088 <math>J &gt; a_N</math> <math>D</math>: 0.0041</p>	99Shu1
Molecular Mechanics calculations reported.			
<p>[C<sub>32</sub>H<sub>44</sub>N<sub>2</sub>O<sub>2</sub>]</p> 	<p>Synthesis described Toluene ESR / 298</p> <p>Toluene ESR / 77</p>	<p>N: 1.196 4H<sub>o</sub>: 0.226 4H<sub>m</sub>: 0.180 <math>J &gt; a_N</math> <math>D</math>: 0.0062</p>	99Shu1
Molecular Mechanics calculations reported.			

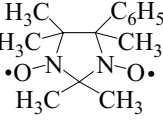
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [ $\text{cm}^{-1}$ ], $E$ [ $\text{cm}^{-1}$ ], $J$ [mT]	Ref. / add. Ref.
$[\text{C}_{33}\text{H}_{34}\text{N}_2\text{O}_2]$ 	Synthesis described Toluene ESR / 298  Toluene ESR / 77	N: 1.176 $4H_o$ : 0.224 $4H_m$ : 0.116 $J > a_N$  $D$ : 0.0046	99Shu1
Molecular Mechanics calculations reported.			
$[\text{C}_{38}\text{H}_{40}\text{N}_2\text{O}_2]$ 	Synthesis described SQUID / 5 to 10	$2J$ : $67 \pm 11 \text{ cm}^{-1}$	95Kan2
INDO calculations reported.			

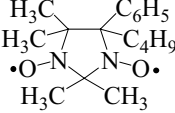
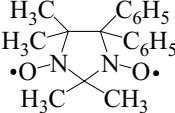
### 12.5.1.3 Bis(alkyl-acylnitroxides)

$[\text{C}_{17}\text{H}_{30}\text{N}_4\text{O}_6]$ 	Photoreaction of corresponding dihydroxamic acid and $\text{H}_2\text{O}_2$ Water ESR / 298	Twelve lines spectrum N: 0.760 $3H_\beta$ : 0.880 $J \ll a_N$	98Ngu1
$[\text{C}_{18}\text{H}_{30}\text{N}_6\text{O}_8]$ 	Photoreaction of corresponding dihydroxamic acid and $\text{H}_2\text{O}_2$ Water ESR / 298	Twelve lines spectrum N: 0.772 $3H_\beta$ : 0.860 $J \ll a_N$	98Ngu1

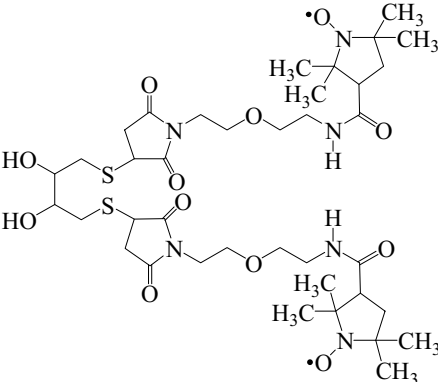
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>18</sub>H<sub>30</sub>N<sub>6</sub>O<sub>8</sub>]</p> 	Photoreaction of corresponding dihydroxamic acid and H <sub>2</sub> O <sub>2</sub> Water ESR / 298	Nine lines spectrum N: 0.790 2H <sub>β</sub> : 0.630 $J \ll a_N$	98Ngu1
<p>[C<sub>20</sub>H<sub>34</sub>N<sub>6</sub>O<sub>8</sub>]</p> 	Photoreaction of corresponding dihydroxamic acid and H <sub>2</sub> O <sub>2</sub> Water ESR / 298	Nine lines spectrum N: 0.773 2H <sub>β</sub> : 0.881 $J \ll a_N$	98Ngu1
<p>[C<sub>21</sub>H<sub>36</sub>N<sub>6</sub>O<sub>8</sub>]</p> 	Photoreaction of corresponding dihydroxamic acid and H <sub>2</sub> O <sub>2</sub> Water ESR / 298	Twelve lines spectrum N: 0.770 3H <sub>β</sub> : 0.881 $J \ll a_N$	98Ngu1

## 12.5.1.4 3-Imidazolidinyl bisnitroxides

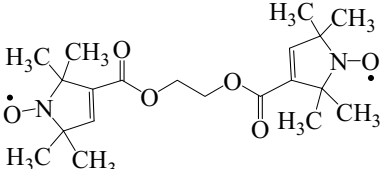
<p>[C<sub>14</sub>H<sub>20</sub>N<sub>2</sub>O<sub>2</sub>]</p> 	<p>Oxidation of corresponding dihydroxy imidazolidine with MnO<sub>2</sub> Toluene solution ESR</p> <p>Toluene Glass ESR / 77</p>	<p>Single line spectrum <math>\Delta H_{pp}</math> 10 to 15 mT</p> <p>2D: 161.6 mT <math> E  \ll  D </math></p>	93Rez1, 93Rez2
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Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
$[C_{17}H_{26}N_2O_2]$ 	Oxidation of corresponding dihydroxy imidazolidine with $MnO_2$ Toluene solution ESR  Toluene Glass ESR / 77	Single line spectrum $\Delta H_{pp}$ 10 to 15 mT  $2D$ : 160.2 mT $ E  \ll  D $	93Rez1, 93Rez2
$[C_{19}H_{22}N_2O_2]$ 	Oxidation of corresponding dihydroxy imidazolidine with $MnO_2$ Toluene solution ESR  Toluene Glass ESR / 77	Single line spectrum $\Delta H_{pp}$ 10 to 15 mT  <i>Conformer I</i> $2D$ : 160.8 mT $ E  \ll  D $ <i>Conformer II</i> $2D$ : 149.6 mT $ E  \ll  D $	93Rez1, 93Rez2

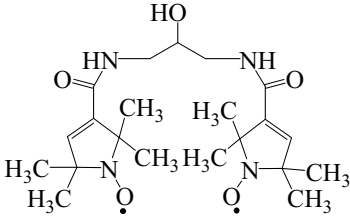
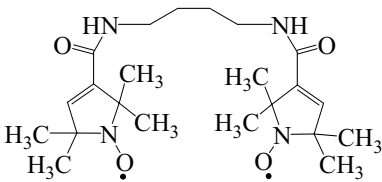
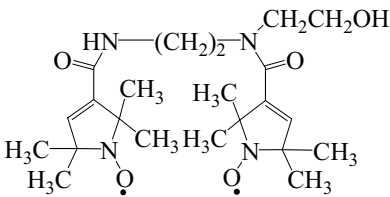
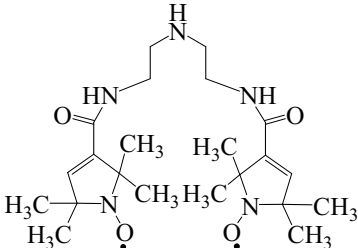
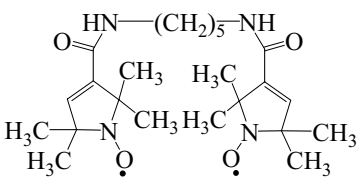
12.5.1.5 Bis(2,2,5,5-tetramethylpyrrolidinyl-*N*-oxyl)

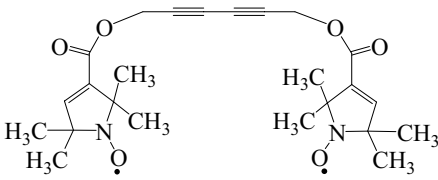
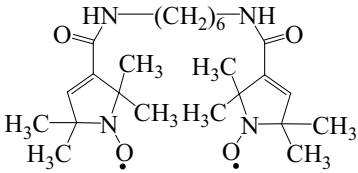
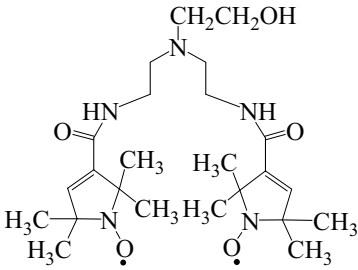
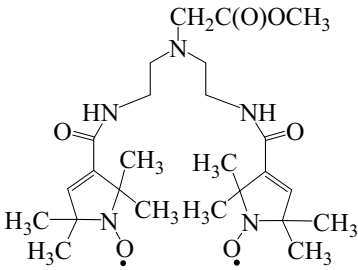
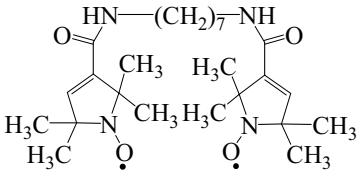
$[C_{38}H_{62}N_6O_{12}S_2]$ 	ESR / 309 to 343	<i>Conformer I</i> 2.0036 N: 1.603 $J = 0 \text{ cm}^{-1}$ <i>Conformer II</i> 2.0036 N: 1.603 $J = 0.0495 \text{ cm}^{-1}$	93San1
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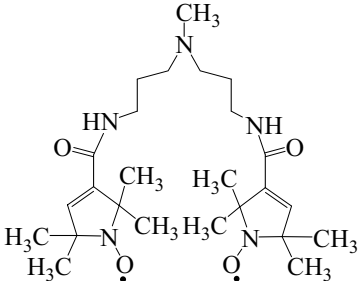
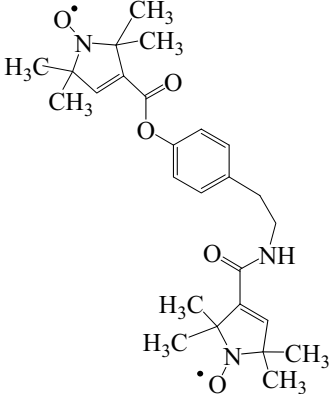
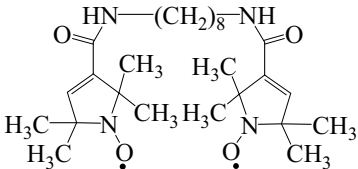
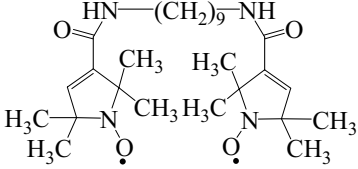
12.5.1.6 Bis(2,2,5,5-tetramethylpyrrolidinyl-*N*-oxyl)

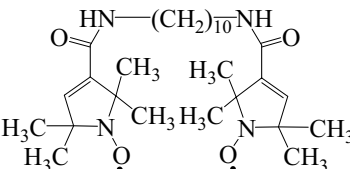
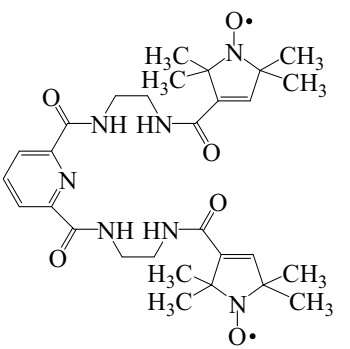
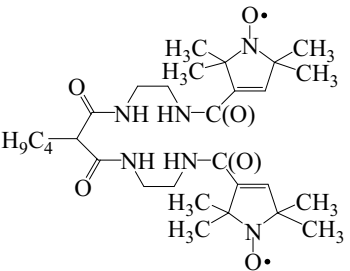
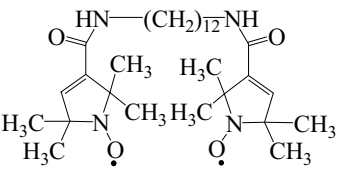
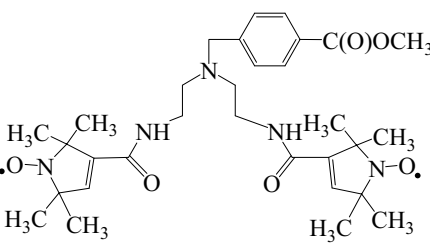
$[C_{20}H_{30}N_2O_6]$ 	Synthesis described Benzene ESR	Five lines spectrum 2.0059 N: 1.41 $J \gg a_N$	96Dra1
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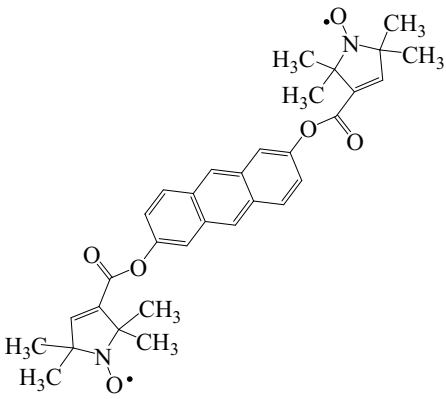
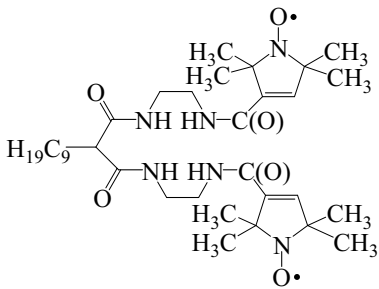
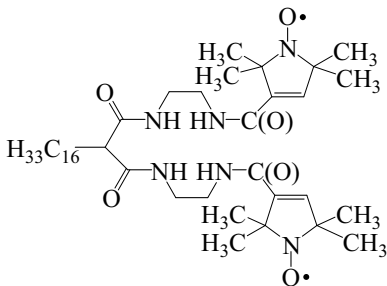


Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
$[C_{21}H_{34}N_4O_5]$ 	Synthesis described Chloroform ESR	N: 1.50 $J \gg a_N$	90Bri1
$[C_{22}H_{36}N_4O_4]$ 	Synthesis described Chloroform ESR	Five lines spectrum N: 1.490 $J \gg a_N$	90Bri1
$[C_{22}H_{36}N_4O_5]$ 	Synthesis described Chloroform ESR	Five lines spectrum N: 1.480 $J \gg a_N$	90Bri1
$[C_{22}H_{37}N_5O_4]$ 	Synthesis described ESR Toluene Water	Five lines spectrum N: 1.580 $J \gg a_N$ $J \sim a_N$	95Mar1
$[C_{23}H_{38}N_4O_4]$ 	Synthesis described Chloroform ESR	Five lines spectrum N: 1.50 $J \sim a_N$	90Bri1

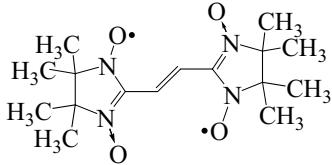
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [ $\text{cm}^{-1}$ ], $E$ [ $\text{cm}^{-1}$ ], $J$ [mT]	Ref. / add. Ref.
$[\text{C}_{24}\text{H}_{30}\text{N}_2\text{O}_6]$ 	Synthesis described Neat solid ESR / 273	Single line $\alpha$ -Form 2.007 $\Delta H_{pp}$ : 1.2 $\beta$ -Form 2.007 $\Delta H_{pp}$ : 2.0	89Will
$[\text{C}_{24}\text{H}_{40}\text{N}_4\text{O}_4]$ 	Synthesis described Chloroform ESR	Five lines spectrum $N$ : 1.518 $J \sim a_N$	90Bri1
$[\text{C}_{24}\text{H}_{41}\text{N}_5\text{O}_5]$ 	Synthesis described ESR Toluene Water	Five lines spectrum $N$ : 1.56 $J \gg a_N$ $J \sim a_N$	95Mar1
$[\text{C}_{25}\text{H}_{41}\text{N}_5\text{O}_6]$ 	Synthesis described ESR Toluene Water	Five lines spectrum $N$ : 1.57 $J \gg a_N$ $J \sim a_N$	95Mar1
$[\text{C}_{25}\text{H}_{42}\text{N}_4\text{O}_4]$ 	Synthesis described Chloroform ESR	Five lines spectrum $N$ : 1.449 $J \sim a_N$	90Bri1

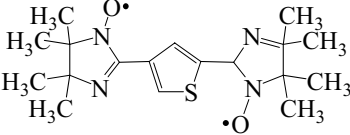
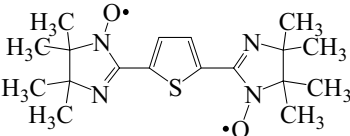
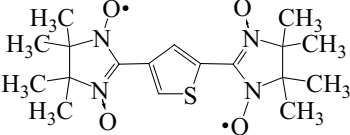
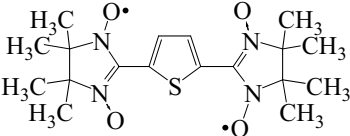
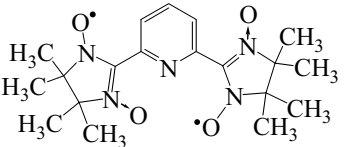
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [ $\text{cm}^{-1}$ ], $E$ [ $\text{cm}^{-1}$ ], $J$ [mT]	Ref. / add. Ref.
$[\text{C}_{25}\text{H}_{43}\text{N}_5\text{O}_4]$ 	Synthesis described Chloroform ESR	Five lines spectrum $N$ : 1.50 $J \sim a_N$	90Bri1
$[\text{C}_{26}\text{H}_{35}\text{N}_3\text{O}_5]$ 	Synthesis described Benzene ESR	Five lines spectrum 2.0059 $N$ : 1.404 $J \gg a_N$	96Dra1
$[\text{C}_{26}\text{H}_{44}\text{N}_4\text{O}_4]$ 	Synthesis described Chloroform ESR	Five lines spectrum $N$ : 1.54 $J \sim a_N$	90Bri1
$[\text{C}_{27}\text{H}_{46}\text{N}_4\text{O}_4]$ 	Synthesis described Chloroform ESR	Five lines spectrum $N$ : 1.5 $J \sim a_N$	90Bri1

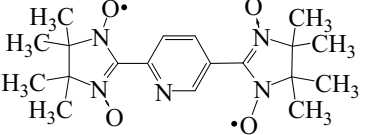
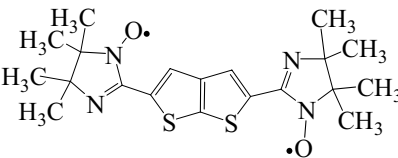
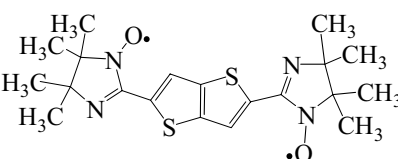
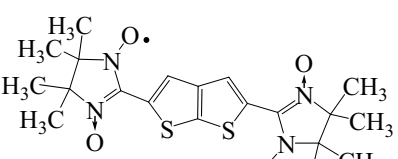
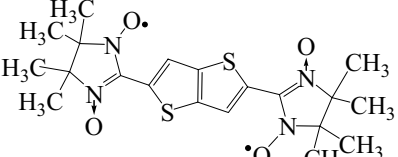
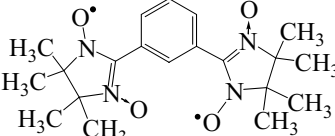
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [ $\text{cm}^{-1}$ ], $E$ [ $\text{cm}^{-1}$ ], $J$ [mT]	Ref. / add. Ref.
$[\text{C}_{28}\text{H}_{48}\text{N}_4\text{O}_4]$ 	Synthesis described Chloroform ESR	Five lines spectrum N: 1.55 $J \sim a_N$	90Bri1
$[\text{C}_{29}\text{H}_{41}\text{N}_7\text{O}_6]$ 	Synthesis described $\text{CH}_2\text{Cl}_2$ ESR	Five lines spectrum N: 1.55 $J > a_N$	94Bri1
$[\text{C}_{29}\text{H}_{48}\text{N}_6\text{O}_6]$ 	Synthesis described $\text{CH}_2\text{Cl}_2$ ESR	Five lines spectrum N: 1.5 $J > a_N$	94Bri1
$[\text{C}_{30}\text{H}_{52}\text{N}_4\text{O}_4]$ 	Synthesis described Chloroform ESR	Five lines spectrum N: 1.542 $J \sim a_N$	90Bri1
$[\text{C}_{31}\text{H}_{45}\text{N}_5\text{O}_6]$ 	Synthesis described ESR Toluene Water	Five lines spectrum N: 1.57 $J \gg a_N$ $J \sim a_N$	95Mar1

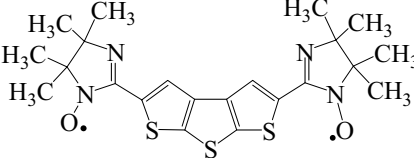
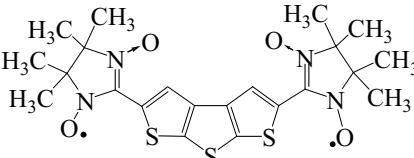
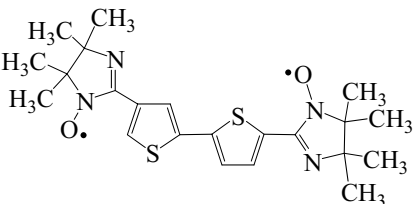
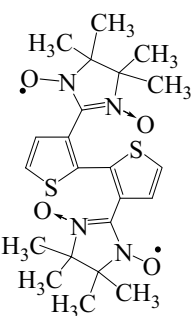
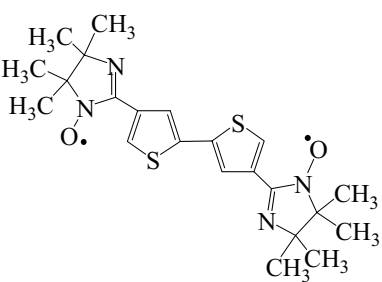
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>32</sub>H<sub>34</sub>N<sub>2</sub>O<sub>6</sub>]</p> 	Toluene ESR / 298	2.006 N: 1.42 Additional hyperfine structure also observed  Interspin distance determined as 19.75 Å in a DEER spin-echo experiment at 77 K in toluene glass.	93Lar1
<p>[C<sub>34</sub>H<sub>58</sub>N<sub>6</sub>O<sub>6</sub>]</p> 	Synthesis described CH <sub>2</sub> Cl <sub>2</sub> ESR	Five lines spectrum N: 1.5 $J > a_N$	94Bri1
<p>[C<sub>41</sub>H<sub>72</sub>N<sub>6</sub>O<sub>6</sub>]</p> 	Synthesis described CH <sub>2</sub> Cl <sub>2</sub> ESR	Five lines spectrum N: 1.5 $J > a_N$	94Bri1

#### 12.5.1.7 Bis(3-imidazolinyl-*N*-oxyls) and bis(3-imidazolinyl-*N*-oxyls 3-oxide)

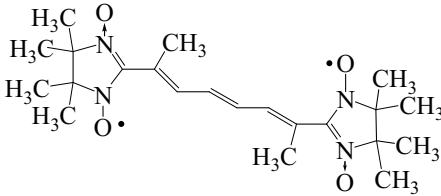
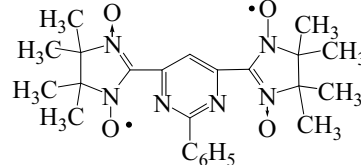
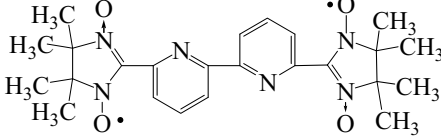
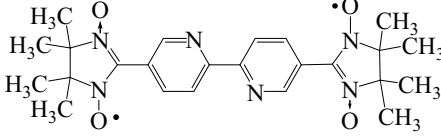
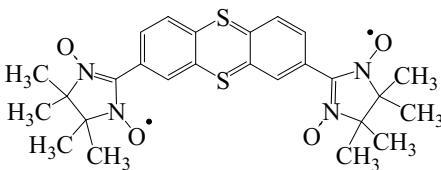
<p>[C<sub>16</sub>H<sub>26</sub>N<sub>4</sub>O<sub>4</sub>]</p> 	<p>Synthesis outlined CH<sub>2</sub>Cl<sub>2</sub> ESR / 298</p> <p>Frozen solution ESR</p> <p>Polystyrene matrix SQUID / 200 to 300</p>	<p>Nine lines spectrum 2.0067 2N: 0.750 <math>J \gg a_N</math>  <math>D</math>: 16.8 mT  <math>2J/k_B</math>: -469 K</p>	98Str1
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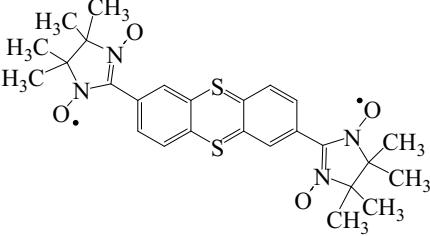
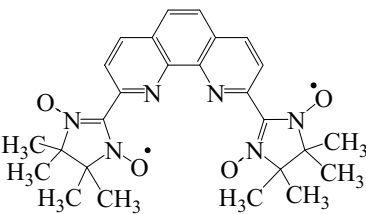
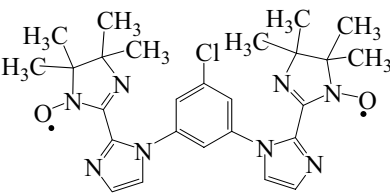
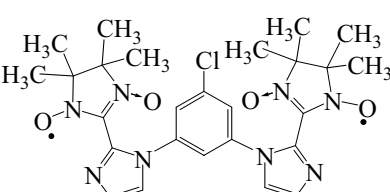
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
$[C_{18}H_{26}N_4O_2S]$ 	Synthesis described Toluene ESR / 298  ESR / 40  Microcrystalline sample SQUID / 2 to 350  $J'$ = Interdimer interaction.	Broad singlet 2.0059 $\Delta H_{pp}$ : 1.08 mT  $D$ : 0.0066  $J/k_B$ : 16 K $J'/k_B$ : 105 K	95Mit1
$[C_{18}H_{26}N_4O_2S]$ 	Synthesis described Toluene ESR / 298  ESR / 40  Microcrystalline sample SQUID / 2 to 350	Broad singlet 2.0060  $D$ : 0.0108  $J/k_B$ : -29.7 K	95Mit1
$[C_{18}H_{26}N_4O_4S]$ 	Synthesis described Toluene ESR / 298  ESR / 40  Microcrystalline sample SQUID / 2 to 350	Five lines spectrum 2.0065 $2N$ : 0.77  $D$ : 0.0071  $J/k_B$ : 40 K	95Mit1
$[C_{18}H_{26}N_4O_4S]$ 	Synthesis described Toluene ESR / 298  ESR / 40  Microcrystalline sample SQUID / 2 to 350  $J'$ = Interdimer interaction.	Five lines spectrum 2.0065 $N$ : 0.77 $J \gg a_N$  $D$ : 0.0071  $J/k_B$ : -114.6 K $J'/k_B$ : -34 K	95Mit1
$[C_{19}H_{27}N_5O_4]$ 	Synthesis described $CH_2Cl_2$ ESR / 358  ESR / 223  Microcrystalline sample SQUID / 2 to 300	Nine lines spectrum $2N$ : 0.66 $J \gg a_N$  5 lines spectrum $2N$ : 0.75 $J \sim a_N$  $J/k_B$ : 9.4 K	99Zie1

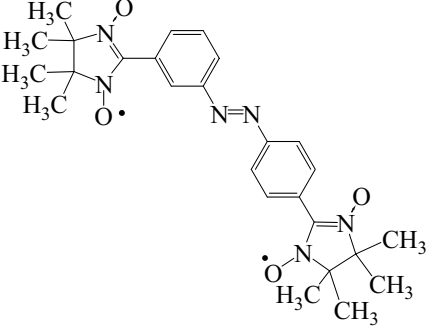
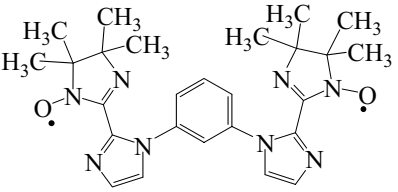
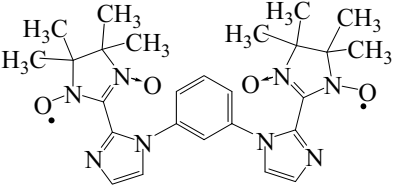
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>19</sub>H<sub>27</sub>N<sub>5</sub>O<sub>4</sub>]</p> 	<p>Synthesis described CH<sub>2</sub>Cl<sub>2</sub> ESR / 358 ESR / 223</p> <p>Microcrystalline sample SQUID / 2 to 300</p>	<p>Nine lines spectrum 2N: 0.72 <math>J \gg a_N</math></p> <p>5 lines spectrum 2N: 0.76 <math>J \sim a_N</math></p> <p><math>J/k_B</math>: -39 K</p>	99Zie1
<p>[C<sub>20</sub>H<sub>26</sub>N<sub>4</sub>O<sub>2</sub>S<sub>2</sub>]</p> 	<p>Synthesis described MTHF ESR / 298</p> <p>ESR / 8 to 100</p>	<p>Thirteen lines spectrum 2.0053 N: 0.44 N: 0.90 <math>J \gg a_N</math></p> <p><math>2J/k_B</math>: -18 K</p>	95Aki1, 96Aki1
<p>[C<sub>20</sub>H<sub>26</sub>N<sub>4</sub>O<sub>2</sub>S<sub>2</sub>]</p> 	<p>Synthesis described MTHF ESR / 298</p> <p>MTHF ESR / 6 to 75</p> <p>ESR / 8 to 100</p>	<p>Thirteen lines spectrum <math>J \gg a_N</math></p> <p>2.0055, 2.0055, 2.0100 <math>D</math>: 2.850 mT <math>E</math>: 0.300 mT</p> <p><math>2J/k_B</math>: -23 K</p>	95Aki1
<p>[C<sub>20</sub>H<sub>26</sub>N<sub>4</sub>O<sub>4</sub>S<sub>2</sub>]</p> 	<p>Synthesis described MTHF ESR / 298</p> <p>SQUID / 2 to 300</p>	<p>Nine lines spectrum 2.0070 2N: 0.76 <math>J \gg a_N</math></p> <p><math>2J/k_B</math>: -7 K</p>	95Aki1, 96Aki1
<p>[C<sub>20</sub>H<sub>26</sub>N<sub>4</sub>O<sub>4</sub>S<sub>2</sub>]</p> 	<p>Synthesis described MTHF ESR / 298</p> <p>MTHF ESR / 6 to 75</p> <p>ESR / 8 to 50</p>	<p>Nine lines spectrum <math>J \gg a_N</math></p> <p>2.0055, 2.0055, 2.0100 <math>D</math>: 2.850 mT <math>E</math>: 0.300 mT</p> <p><math>2J/k_B</math>: -28 K</p>	95Aki1
<p>[C<sub>20</sub>H<sub>28</sub>N<sub>4</sub>O<sub>4</sub>]</p> 	<p>ESR / 298</p> <p>ESR / 10 to 140</p>	<p>2.0083, 2.0076, 2.0039 <math> D </math>: 8.9 mT <math> E </math>: ~0.6 mT</p> <p><math>J/k_B</math>: 39 K</p>	93Shi1, 99Cat1

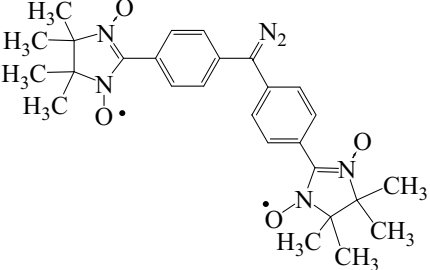
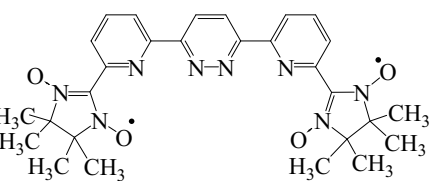
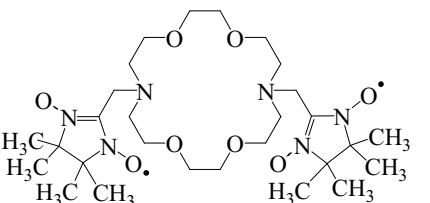
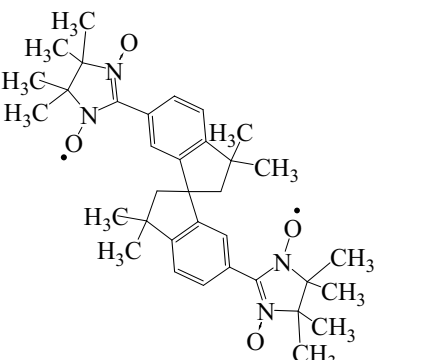
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
$[C_{22}H_{26}N_4O_2S_3]$ 	Synthesis described MTHF ESR / 298  Diluted sample in PVC SQUID / 2 to 300	Thirteen lines spectrum 2.0056 N: 0.92 N: 0.46 $J \gg a_N$ $2J/k_B: \sim 0$	96Aki1
$[C_{22}H_{26}N_4O_4S_3]$ 	Synthesis described MTHF ESR / 298  MTHF glass ESR / 6 to 100  ESR / 6 to 40	Nine lines spectrum 2.0063 2N: 0.74 $J \gg a_N$ 2.0082, 2.0061, 2.0087 $D$ : 2.9 mT $E$ : 0.4 mT $2J/k_B: -11$ K	96Aki1
$[C_{22}H_{28}N_4O_2S_2]$ 	Synthesis described Toluene ESR / 298  Toluene glass ESR / 10 to 298 SQUID / 2 to 350	2.006 N: 1.32 N: 0.66  $ D $ : 0.0037 $J/k_B$ : 3.0 K	95Mit1
$[C_{22}H_{28}N_4O_4S_2]$ 	Synthesis described Toluene ESR / 298  Toluene glass ESR / 10 to 298 SQUID / 2 to 350	Broad singlet  $ D $ : 0.0149 $ E $ : 0.0002 $J/k_B$ : -6.0 K	95Mit1
$[C_{22}H_{28}N_4O_2S_2]$ 	Synthesis described Toluene ESR / 298  Toluene glass ESR / 10 to 298 SQUID / 2 to 350	Five lines spectrum 2.006 N: 1.56  $ D $ : 0.0041 $J/k_B: \sim 0$	95Mit1

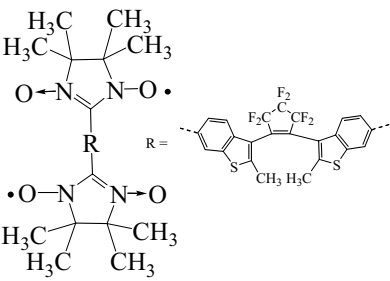
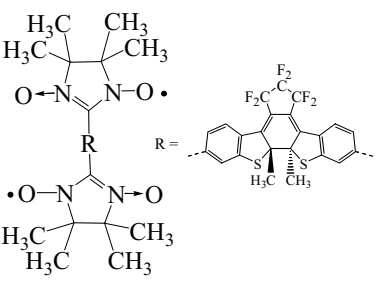
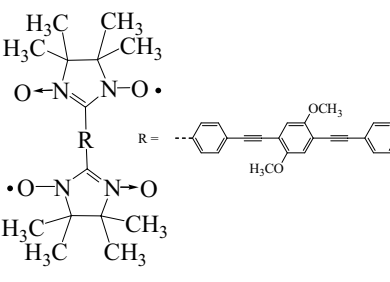
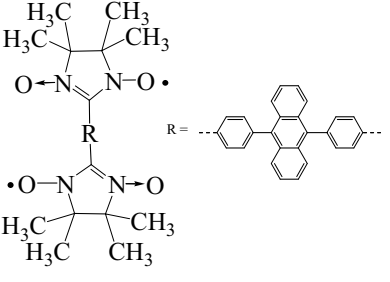


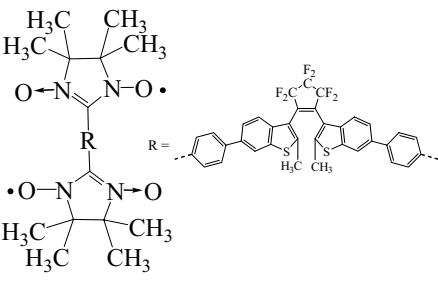
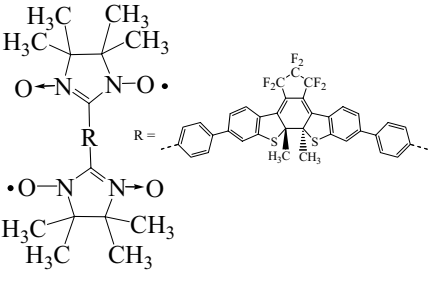
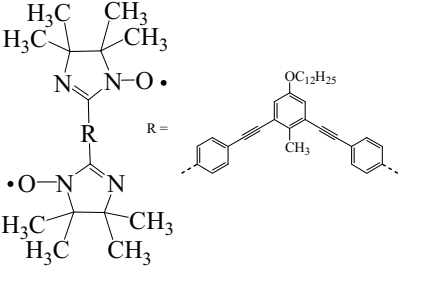
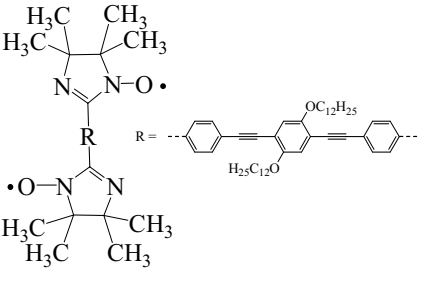
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>22</sub>H<sub>34</sub>N<sub>4</sub>O<sub>4</sub>]</p> 	<p>Synthesis outlined CH<sub>2</sub>Cl<sub>2</sub> ESR / 298</p> <p>Sample dispersed in polystyrene SQUID / 2 to 300</p>	<p>Nine lines spectrum 2.0065 2N: 0.752 <math>J \gg a_N</math> <math>D</math>: ~3.1 mT <math>2J/k_B</math>: -90 K</p>	98Str1
<p>[C<sub>24</sub>H<sub>30</sub>N<sub>6</sub>O<sub>4</sub>]</p> 	<p>Synthesis described Ethanol frozen solution ESR / 77</p> <p>SQUID / 2 to 300</p>	<p><math> D </math>: 0.010 <math> E </math>: 0.002  1.99<sub>1</sub> <math>2J</math>: 2.4<sub>1</sub> cm<sup>-1</sup></p>	97Osh1
<p>[C<sub>24</sub>H<sub>30</sub>N<sub>6</sub>O<sub>4</sub>]</p> 	<p>Synthesis described CH<sub>2</sub>Cl<sub>2</sub> ESR / 298</p> <p>ESR / 223</p> <p>SQUID / 2 to 200</p>	<p>Nine lines spectrum 2N: 0.76 <math>J \gg a_N</math>  Five lines spectrum 2N: 0.75 <math>J \leq a_N</math> 2.00 <math>J/k_B</math>: -24 K</p>	99Zie1
<p>[C<sub>24</sub>H<sub>30</sub>N<sub>6</sub>O<sub>4</sub>]</p> 	<p>Synthesis described CH<sub>2</sub>Cl<sub>2</sub> ESR / 298</p> <p>SQUID / 2 to 200</p>	<p>Nine lines spectrum 2N: 0.76 <math>J \gg a_N</math> 2.00 <math>J/k_B</math>: -1.9 K</p>	99Zie1
<p>[C<sub>26</sub>H<sub>30</sub>N<sub>4</sub>O<sub>4</sub>S<sub>2</sub>]</p> 	<p>Benzene ESR / 298</p> <p>SQUID</p> <p>Treating a solution of the dinitroxide with excess iodine leads to a cation triradical <math>D</math>: 0.0124, <math>E</math>: 0.0009.</p>	<p>Nine lines spectrum 2.0062 2N: 7.8 <math>J &gt; a_N</math> <math>J/k_B</math>: -1.4 K</p>	00Izu1

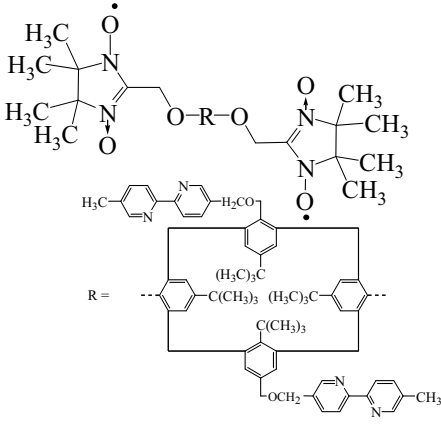
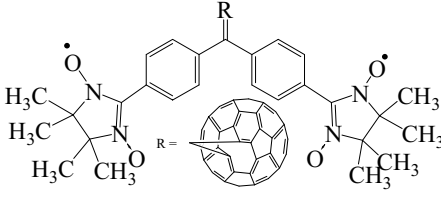
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>26</sub>H<sub>30</sub>N<sub>4</sub>O<sub>4</sub>S<sub>2</sub>]</p> 	<p>Benzene ESR / 298</p> <p>SQUID</p>	<p>Nine lines spectrum 2.0062 2N: 7.8 <math>J &gt; a_N</math> <math>J/k_B</math>: 5.5 K</p>	00Izu1
Treating a solution of the dinitroxide with excess iodine leads to a cation triradical $D$ : 0.0125, $E$ : 0.0009.			
<p>[C<sub>26</sub>H<sub>30</sub>N<sub>6</sub>O<sub>4</sub>]</p> 	<p>Synthesis described CH<sub>2</sub>Cl<sub>2</sub> ESR / 298</p> <p>ESR / 223</p>	<p>Nine lines spectrum 2N: 0.72 <math>J \gg a_N</math></p> <p>Five lines spectrum 2N: 0.76 <math>J \leq a_N</math></p>	99Zie1
<p>[C<sub>26</sub>H<sub>31</sub>ClN<sub>8</sub>O<sub>2</sub>]</p> 	<p>Synthesis outlined Powder</p> <p>MTHF ESR / 298</p> <p>Microcrystalline sample SQUID / 2 to 300</p>	<p>2.007 <math>\Delta H_{pp}</math>: 1.24</p> <p>Seven lines spectrum N: 0.429 N: 0.860 <math>J \ll a_N</math></p> <p>1.930 <math>J/k_B</math>: -0.27 K <math>J'/k_B</math>: -37.3 K</p>	97Aka1
$J'$ refers to intermolecular interactions.			
<p>[C<sub>26</sub>H<sub>31</sub>ClN<sub>8</sub>O<sub>4</sub>]</p> 	<p>Synthesis outlined Powder</p> <p>MTHF ESR / 298</p> <p>Microcrystalline sample SQUID / 2 to 300</p>	<p>2.007 <math>\Delta H_{pp}</math>: 0.80</p> <p>Five lines spectrum 2N: 0.717 <math>J \ll a_N</math></p> <p>1.970 <math>J/k_B</math>: -0.95 K <math>J'/k_B</math>: -4.85 K</p>	97Aka1
$J'$ refers to intermolecular interactions.			

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
$[C_{26}H_{32}N_6O_4]$ 	Synthesis described Toluene ESR / 300  Toluene frozen solution ESR / 10  Microcrystalline sample SQUID / 2 to 300	Nine line spectrum 2.006 2N: 0.74 $J \gg a_N$  $D$ : 0.0026 $E$ : 0.00014  $2J/k_B$ : 8.36 K	98Ham1
$[C_{26}H_{32}N_8O_2]$ 	Synthesis outlined Powder  MTHF ESR / 298  Microcrystalline sample SQUID / 2 to 300	2.012 $\Delta H_{pp}$ : 3.25  Seven lines spectrum N: 0.430 N: 0.860 $J \ll a_N$  2.012 $J/k_B$ : -26.3 K $J'/k_B$ : -239 K	97Aka1
$J'$ refers to intermolecular interactions.			
$[C_{26}H_{32}N_8O_4]$ 	Synthesis outlined Powder  MTHF ESR / 298  MTHF frozen solution ESR / 10  Microcrystalline sample SQUID / 2 to 300	2.009 $\Delta H_{pp}$ : 1.46  Five lines spectrum 2N: 0.726 $J \ll a_N$  <i>Triplet I</i> $ D $ : 0.00726 $ E $ : 0.00002 <i>Triplet II</i> $ D $ : 0.00270 $ E $ : 0.00002  2.009 $J/k_B$ : -34.8 K $J'/k_B$ : -158 K	97Aka1
$J'$ refers to intermolecular interactions.			

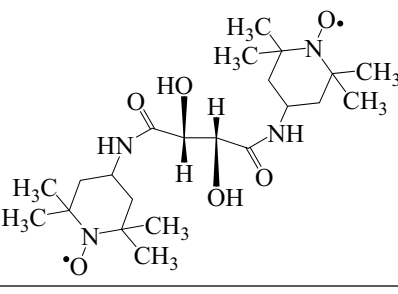
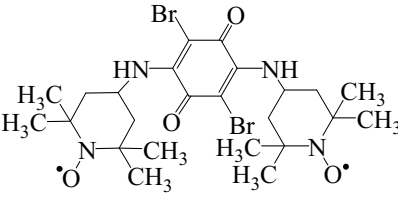
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>27</sub>H<sub>32</sub>N<sub>6</sub>O<sub>4</sub>]</p> 	<p>Synthesis described Toluene ESR / 298</p>	<p>Nine lines spectrum 2.006 2N: 7.4 <math>J &gt; a_N</math></p>	98Mat1
<p>[C<sub>28</sub>H<sub>32</sub>N<sub>8</sub>O<sub>4</sub>]</p> 	<p>Synthesis described CH<sub>2</sub>Cl<sub>2</sub> ESR / 298 ESR / 223</p>	<p>Nine lines spectrum 2N: 0.76 <math>J \gg a_N</math>  Five lines spectrum 2N: 0.76 <math>J \leq a_N</math></p>	99Zie1
<p>[C<sub>28</sub>H<sub>52</sub>N<sub>6</sub>O<sub>8</sub>]</p> 	<p>Toluene / CH<sub>2</sub>Cl<sub>2</sub> ESR / 298  Toluene / CH<sub>2</sub>Cl<sub>2</sub> / Li<sup>+</sup> ESR / 298</p>	<p>Nine lines spectrum <math>J &gt; a_N</math>  Five lines spectrum* 2N: 0.760 2H<sub>γ</sub>(CH<sub>2</sub>): 0.160 N<sub>γ</sub>: 0.065 <math>J &lt; a_N</math></p>	96Ulr1
* In the case of Cs <sup>+</sup> , hyperfine structure from the alkali cation is also observed.			
<p>[C<sub>35</sub>H<sub>46</sub>N<sub>4</sub>O<sub>4</sub>]</p> 	<p>Synthesis described Single crystal  Powder ESR / 298  ESR CH<sub>2</sub>Cl<sub>2</sub> / 298  CH<sub>2</sub>Cl<sub>2</sub> / 190  ESR / 4 to 136</p>	<p>2.013, 2.0054, 2.0045  Single broad line 2.0032 <math>\Delta H_{pp}</math>: 11.5  Nine lines spectrum 2.0032 2N: 0.75 <math>J \gg a_N</math>  Five lines spectrum 2.0032 2N: 0.75 <math>J &lt; a_N</math>  <math>J: -4^\heartsuit</math></p>	00Fra1
* Density functional B3LYP/6-311G(d) calculations afford $J = 0$ .			

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>37</sub>H<sub>36</sub>F<sub>6</sub>N<sub>4</sub>O<sub>4</sub>S<sub>2</sub>]</p> 	<p>Synthesis described Benzene ESR / 298</p> <p>SQUID / 2 to 300</p>	<p>Nine lines spectrum 2.007 2N:0.74 <math>J &gt; a_N</math> <math>2J/k_B</math>: -2.2 K</p>	00Mat1
<p>[C<sub>37</sub>H<sub>36</sub>F<sub>6</sub>N<sub>4</sub>O<sub>4</sub>S<sub>2</sub>]</p> 	<p>Synthesis described Benzene ESR / 298</p> <p>SQUID / 2 to 300 Microcrystalline sample</p> <p>Dispersed in poly(<i>n</i>-butyl methacrylate)</p>	<p>Nine lines spectrum 2.007 2N: 0.74 <math>J &gt; a_N</math> <math>2J/k_B</math>: -11.6 K <math>2J/k_B</math>: -12.5 K</p>	00Mat1
<p>[C<sub>38</sub>H<sub>40</sub>N<sub>4</sub>O<sub>4</sub>]</p> 	<p>Toluene / CH<sub>2</sub>Cl<sub>2</sub> ESR / 293</p>	<p>Thirteen lines spectrum N: 0.444 N: 0.890 <math>J \gg a_N</math></p>	99Cat1
<p>[C<sub>40</sub>H<sub>40</sub>N<sub>4</sub>O<sub>2</sub>]</p> 	<p>Laser photoexcitation MTHF frozen solution ESR / 30</p> <p>Powder sample SQUID / 2 to 300</p>	<p>2.0043 <math>D</math>: 0.0130 <math>E</math>: 0.0 Values refer to a quintet state (<math>S = 2</math>) due to excitation of the anthracene moiety. Weak antiferromagnetic interaction</p>	00Tek1

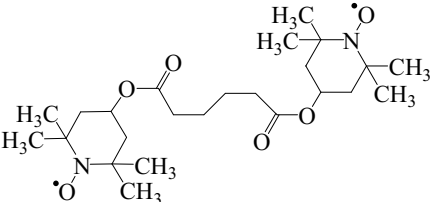
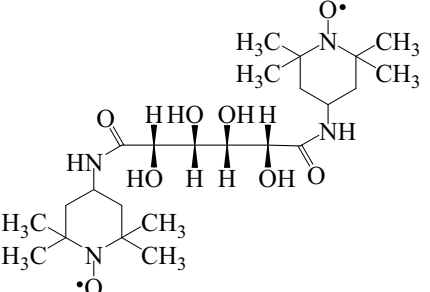
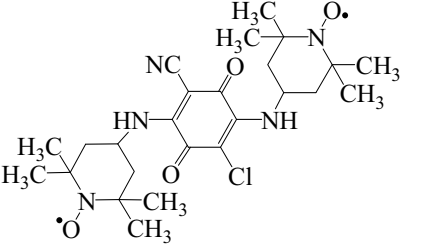
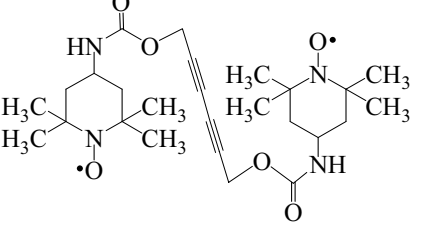
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>49</sub>H<sub>44</sub>F<sub>6</sub>N<sub>4</sub>O<sub>4</sub>S<sub>2</sub>]</p> 	Synthesis described Benzene ESR / 298	Fifteen lines spectrum 2.007 $J \sim a_N$ $2J/k_B: \sim 0.001$ K	00Mat2
<p>[C<sub>49</sub>H<sub>44</sub>F<sub>6</sub>N<sub>4</sub>O<sub>4</sub>S<sub>2</sub>]</p> 	Photolysis of the open form (preceding entry) Benzene ESR / 298	Nine lines spectrum 2.007 $2N: 0.74$ $J \gg a_N$ $2J/k_B > 0.08$ K	00Mat2
<p>[C<sub>49</sub>H<sub>62</sub>N<sub>4</sub>O<sub>3</sub>]</p> 	<i>p</i> -Xylene / CH <sub>2</sub> Cl <sub>2</sub> ESR / 298  <i>p</i> -Xylene / CH <sub>2</sub> Cl <sub>2</sub> glassy solution EPR / 4 to 120	Thirteen lines spectrum $J \geq a_N$ $2J/k_B: \sim -1.7$ K	95Tur1
Semiempirical MO calculations of spin density reported.			
<p>[C<sub>60</sub>H<sub>84</sub>N<sub>4</sub>O<sub>4</sub>]</p> 	<i>p</i> -Xylene / CH <sub>2</sub> Cl <sub>2</sub> ESR / 294.9  <i>p</i> -Xylene / CH <sub>2</sub> Cl <sub>2</sub> glassy solution EPR / 4 to 120	Thirteen lines spectrum $N: 0.444$ $N: 0.890$ $J \gg a_N$ $2J/k_B: -2.6$ K	95Tur1
Semiempirical MO calculations of spin density reported.			

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>84</sub>H<sub>102</sub>N<sub>8</sub>O<sub>8</sub>]</p> 	<p>Synthesis outlined Toluene / CH<sub>2</sub>Cl<sub>2</sub> ESR / 298</p>	<p>Nine lines spectrum 2N: 0.720 <math>J \gg a_N</math> In the presence of a Zn<sup>2+</sup> cation the spectrum collapses to a quintet due to a drastic reduction of <math>J</math>. Smaller cations (Li<sup>+</sup>, Na<sup>+</sup>, K<sup>+</sup>) have little effect if any.</p>	96Ulr2
<p>[C<sub>87</sub>H<sub>32</sub>N<sub>4</sub>O<sub>4</sub>]</p> 	<p>Synthesis described Toluene ESR / 298</p>	<p>Nine lines spectrum 2.006 2N: 0.68 <math>J &gt; a_N</math></p>	98Mat1

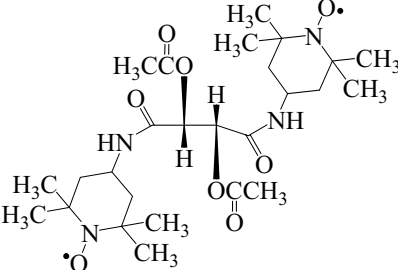
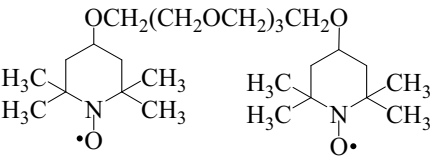
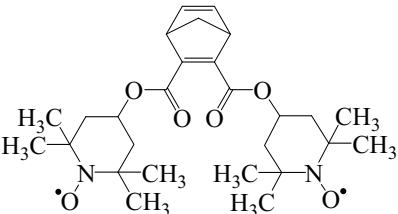
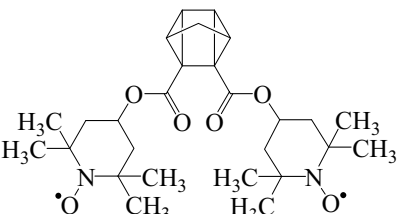
#### 12.5.1.8 Bis(2,2,6,6-tetramethylpiperidinyl-*N*-oxyls)

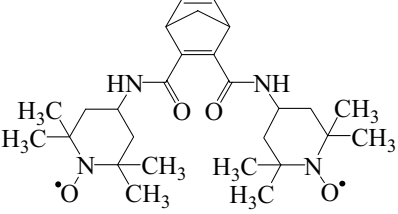
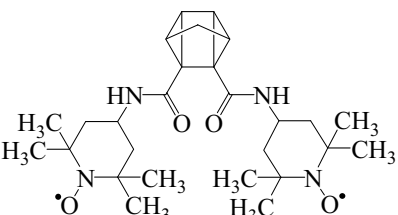
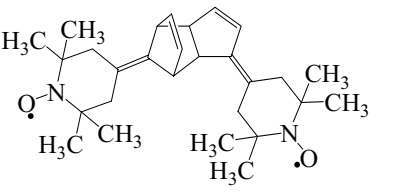
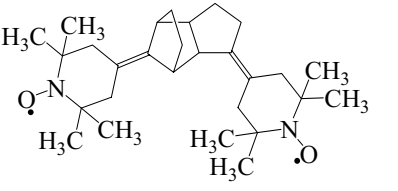
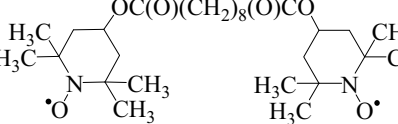
<p>[C<sub>22</sub>H<sub>40</sub>N<sub>4</sub>O<sub>6</sub>]</p> 	<p>Synthesis described ESR / 298 CH<sub>2</sub>Cl<sub>2</sub> Water</p>	<p>Five lines spectrum N: 1.60 <math>J &gt; a_N</math>  Three lines spectrum N: 1.65 <math>J &lt; a_N</math></p>	89Sos1
<p>[C<sub>24</sub>H<sub>36</sub>Br<sub>2</sub>N<sub>4</sub>O<sub>4</sub>]</p> 	<p>Synthesis described Benzene ESR / 298</p>	<p>Three lines spectrum 2.007 N: 1.58 <math>J &lt; a_N</math></p>	96Nak1

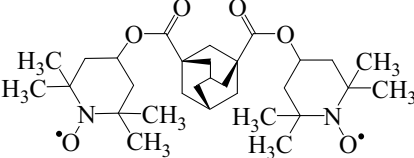
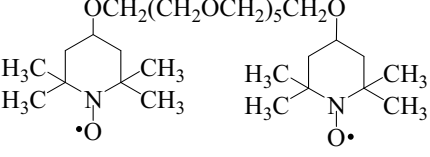
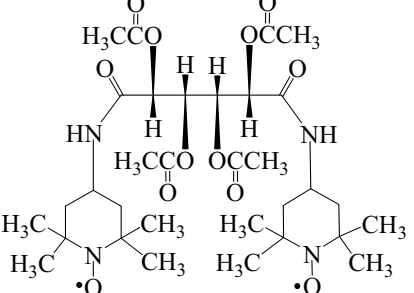
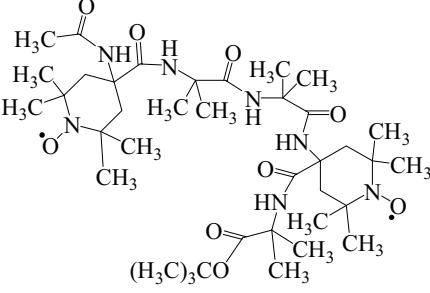
Identical spectra observed for the analogous dichloro compound.

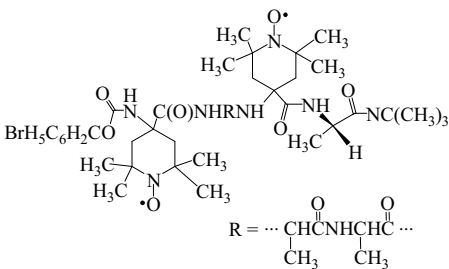
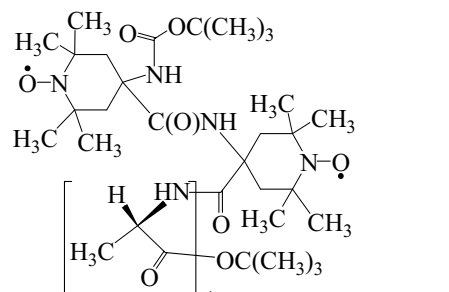
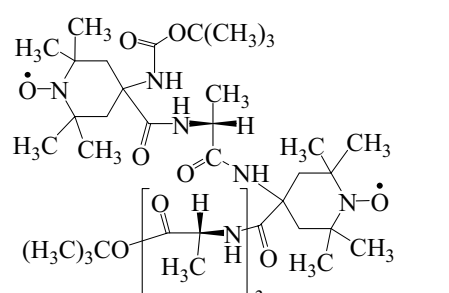
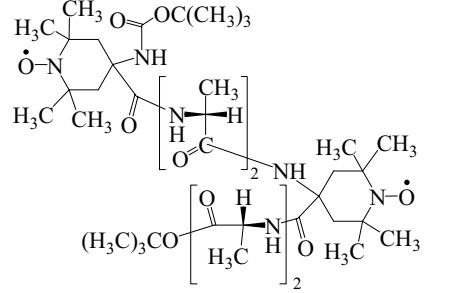
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [ $\text{cm}^{-1}$ ], $E$ [ $\text{cm}^{-1}$ ], $J$ [mT]	Ref. / add. Ref.
$[\text{C}_{24}\text{H}_{42}\text{N}_2\text{O}_6]$ 	Synthesis described $d_1$ -Ethanol ESR / 273 to 353 273 353  Photolysis of a benzene solution of bisnitroxide containing some benzophenone TR-ESR	Five lines spectrum with linewidth alternation $N$ : 1.595 $J/a_N$ : 6 $J/a_N$ : 14  Emissively polarized five lines spectrum with anomalous intensity ratios attributed to simultaneous presence of a doublet species ( $N$ : $\sim 1.6$ , $J \approx 0$ ) and a triplet species ( $N$ : $\sim 1.6$ , $J \gg a_N$ ).	95Chi1  93Tur1
$[\text{C}_{24}\text{H}_{44}\text{N}_4\text{O}_8]$ 	Synthesis described ESR / 298 $\text{CH}_2\text{Cl}_2$ (Water)	Three lines spectrum $N$ : 1.55 $J < a_N$	89Sos1
$[\text{C}_{25}\text{H}_{36}\text{ClN}_5\text{O}_4]$ 	Synthesis described Benzene ESR / 298	Three lines spectrum 2.007 $N$ : 1.58 $J < a_N$	96Nak1
$[\text{C}_{26}\text{H}_{40}\text{N}_4\text{O}_6]$ 	Synthesis described Chloroform ESR / 243 to 293	Three lines spectrum $J < a_N$	91Dul1

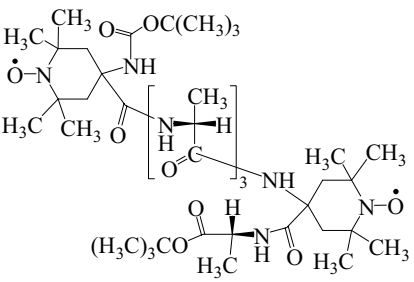
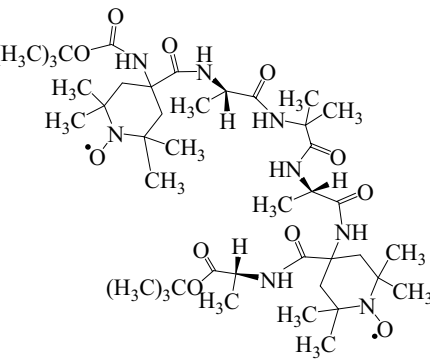
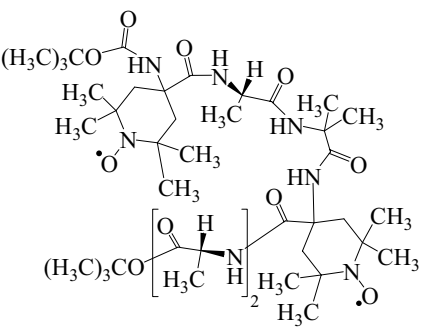
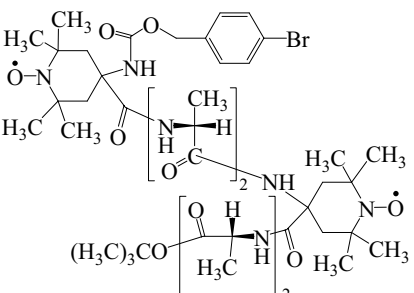


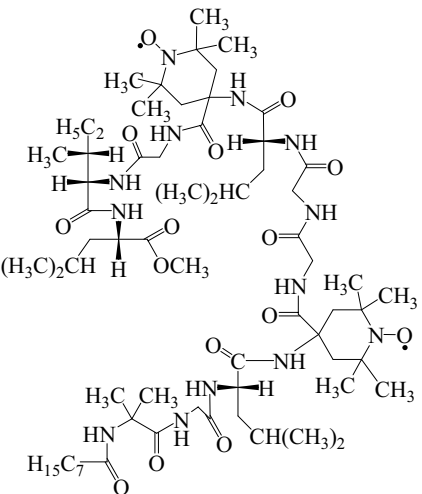
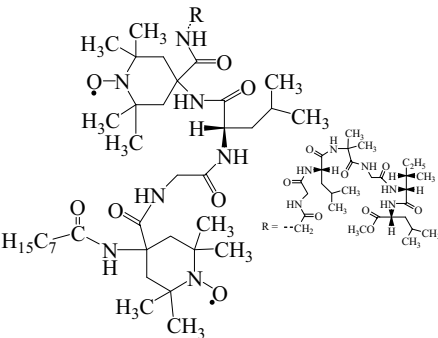
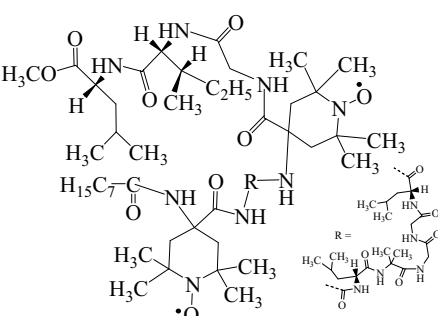
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>26</sub>H<sub>44</sub>N<sub>4</sub>O<sub>8</sub>]</p> 	<p>Synthesis described CH<sub>2</sub>Cl<sub>2</sub> ESR / 298</p>	<p>Three lines spectrum N: 1.55 <math>J &lt; a_N</math></p>	89Sos1
<p>[C<sub>26</sub>H<sub>50</sub>N<sub>2</sub>O<sub>7</sub>]</p> 	<p>Synthesis described Toluene ESR / 298</p> <p>Toluene CH<sub>2</sub>Cl<sub>2</sub> Ethyl ether Ethanol</p> <p>Ethanol / K<sup>+</sup> ESR / 120</p> <p>♦ In the absence of the potassium cation the frozen solution spectrum of the doublet species is observed.</p>	<p>Five lines spectrum due to the simultaneous presence of a doublet (<math>J = 0</math>) and of a triplet (<math>J &gt; a_N</math>) species N: 1.476 N: 1.568 N: 1.537 N: 1.590</p> <p>Triplet spectrum♦ <math>D</math>: 17.5 mT</p>	89Gag1
<p>[C<sub>27</sub>H<sub>40</sub>N<sub>2</sub>O<sub>6</sub>]</p> 	<p>Synthesis described Benzene fluid solution ESR</p> <p>MTHF frozen solution ESR / 123</p> <p>Powder sample SQUID / 5 to 300</p>	<p>Five lines spectrum <math>J &gt; a_N</math></p> <p><math>D</math>: 4.92 mT <math>E</math>: 0.89 mT</p> <p><math>J/k_B</math>: 0.13 K</p>	00Nak1
<p>[C<sub>27</sub>H<sub>40</sub>N<sub>2</sub>O<sub>6</sub>]</p> 	<p>Synthesis described Benzene fluid solution ESR</p> <p>MTHF frozen solution ESR / 123</p> <p>Powder sample SQUID / 5 to 300</p>	<p>Five lines spectrum <math>J &gt; a_N</math></p> <p><math>D</math>: 4.86 mT <math>E</math>: 0.92 mT</p> <p><math>J/k_B</math>: 0.09 K</p>	00Nak1

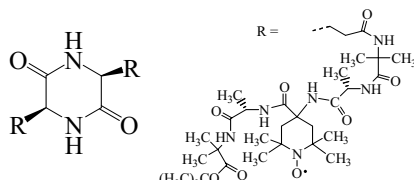
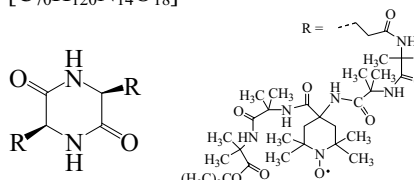
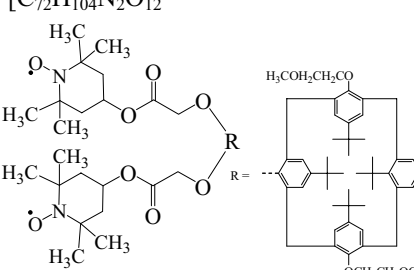
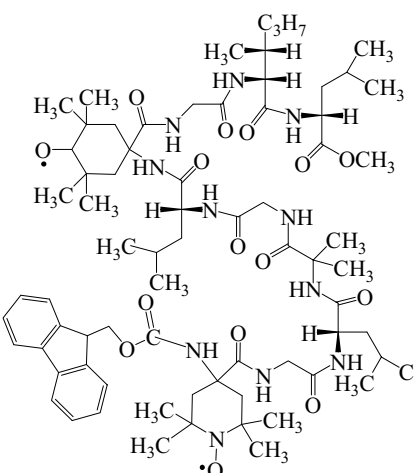
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>27</sub>H<sub>42</sub>N<sub>4</sub>O<sub>4</sub>]</p> 	<p>Synthesis described Benzene fluid solution ESR</p> <p>MTHF frozen solution ESR / 123</p> <p>Powder sample SQUID / 5 to 300</p>	<p>Three lines spectrum 2.007 N: 1.56 <math>J = 0</math></p> <p><math>D</math>: 4.20 mT <math>E</math>: 0.96 mT</p> <p><math>J/k_B</math>: -0.64 K</p>	00Nak1
<p>[C<sub>27</sub>H<sub>42</sub>N<sub>4</sub>O<sub>4</sub>]</p> 	<p>Synthesis described Benzene fluid solution ESR</p> <p>MTHF frozen solution ESR / 123</p> <p>Powder sample SQUID / 5 to 300</p>	<p>Three lines spectrum 2.007 N: 1.56 <math>J = 0</math></p> <p><math>D</math>: 4.22 mT <math>E</math>: 0.91 mT</p> <p><math>J/k_B</math>: -0.68 K</p>	00Nak1
<p>[C<sub>28</sub>H<sub>40</sub>N<sub>2</sub>O<sub>2</sub>]</p> 	<p>Synthesis described Fluid alcoholic solution ESR</p>	<p>Three lines spectrum 2.0056 <math>J \ll a_N</math></p>	91Vor1
<p>[C<sub>28</sub>H<sub>44</sub>N<sub>2</sub>O<sub>2</sub>]</p> 	<p>Synthesis described Fluid alcoholic solution ESR</p>	<p>Three lines spectrum 2.0056 <math>J \ll a_N</math></p>	91Vor1
<p>[C<sub>28</sub>H<sub>51</sub>N<sub>2</sub>O<sub>5</sub>]</p> 	<p>Synthesis described ACN ESR</p> <p>Photolysis of a benzene solution of bisnitroxide containing some benzophenone TR-ESR</p>	<p>Three line spectrum N: ~ 1.6 <math>J \approx 0</math></p> <p>Emissively polarized three lines spectrum N: ~1.6 <math>J \approx 0</math></p>	93Tur1

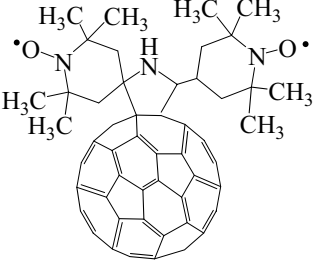
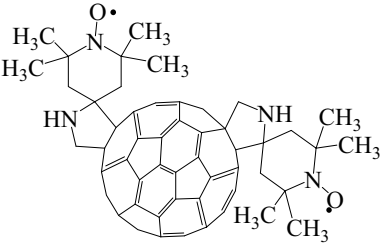
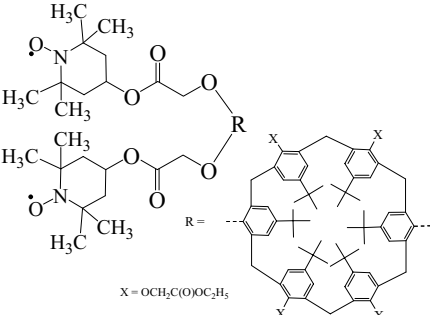
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>30</sub>H<sub>48</sub>N<sub>2</sub>O<sub>6</sub>]</p> 	<p>Synthesis described Isooctane ESR / 298 ESR / 450</p>	<p>Three lines spectrum N: 1.48 <math>J \approx 0</math>  Alternately broadened five lines spectrum N: <math>\sim 1.48</math> <math>J \geq a_N</math></p>	90Sho1
<p>[C<sub>30</sub>H<sub>58</sub>N<sub>2</sub>O<sub>9</sub>]</p> 	<p>Synthesis described Toluene ESR / 298  Toluene frozen matrix ESR / 130  Toluene – Thiourea ESR / 130</p>	<p>Alternately broadened five lines spectrum due to the simultaneous presence of a doublet (<math>J = 0</math>) and of a triplet (<math>J &gt; a_N</math>) species N: 1.55  Frozen spectrum of the doublet species <math>A_{ZZ}</math>: 3.445 mT  Triplet spectrum <math>2D</math>: 15.9 mT <math>\Delta M_s = 2</math>: Five lines signal N: 1.37</p>	91Gag1
<p>[C<sub>32</sub>H<sub>52</sub>N<sub>4</sub>O<sub>12</sub>]</p> 	<p>Synthesis described CH<sub>2</sub>Cl<sub>2</sub> ESR / 298</p>	<p>Three lines spectrum N: 1.55 <math>J &lt; a_N</math></p>	89Sos1
<p>[C<sub>38</sub>H<sub>67</sub>N<sub>7</sub>O<sub>9</sub>]</p> 	<p>Synthesis described ESR / 300 Methanol (Ethanol)  Trifluoroethanol  Hexafluoropropanol</p>	<p>Five lines spectrum <math>J &gt; a_N</math>  Five line spectrum <math>J \leq a_N</math>  Three lines spectrum <math>J \approx 0</math></p>	99Pol1

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [ $\text{cm}^{-1}$ ], $E$ [ $\text{cm}^{-1}$ ], $J$ [mT]	Ref. / add. Ref.
<p>[<math>\text{C}_{41}\text{H}_{65}\text{BrN}_8\text{O}_9</math>]</p>  <p><math>\text{R} = \cdots \text{CH}(\text{CH}_3)\text{C}(=\text{O})\text{NHCH}(\text{CH}_3)\text{C}(=\text{O})\cdots</math></p>	<p>ESR / 298 Methanol (Ethanol)</p> <p>Trifluoroethanol (Hexafluoropropanol)</p>	<p>Alternately broadened five lines spectrum <math>J &gt; a_N</math></p> <p>Three lines spectrum <math>J \ll a_N</math></p>	96Han1
<p>[<math>\text{C}_{41}\text{H}_{72}\text{N}_8\text{O}_{11}</math>]</p> 	<p>ESR / 298 Methanol (Ethanol)</p> <p>Trifluoroethanol</p> <p>Hexafluoropropanol</p>	<p>Five lines spectrum <math>J \gg a_N</math></p> <p>Alternately broadened five lines spectrum <math>J \geq a_N</math></p> <p>Three lines spectrum <math>J \ll a_N</math></p>	96Han1
<p>[<math>\text{C}_{41}\text{H}_{72}\text{N}_8\text{O}_{11}</math>]</p> 	<p>ESR / 298 Methanol (Ethanol, Trifluoroethanol, Hexafluoropropanol)</p>	<p>Three lines spectrum <math>J \ll a_N</math></p>	96Han1, 96Han2
<p>[<math>\text{C}_{41}\text{H}_{72}\text{N}_8\text{O}_{11}</math>]</p> 	<p>ESR / 298 Methanol</p> <p>Ethanol</p> <p>(Trifluoroethanol, Hexafluoropropanol)</p>	<p>Alternately broadened five lines spectrum <math>J \geq a_N</math></p> <p>Three lines spectrum <math>J &lt; a_N</math></p> <p>Three lines spectrum <math>J \ll a_N</math></p>	96Han1, 96Han2

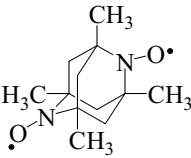
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>41</sub>H<sub>72</sub>N<sub>8</sub>O<sub>11</sub>]</p> 	<p>ESR / 298 Methanol (Ethanol)</p> <p>(Trifluoroethanol, Hexafluoropropanol)</p>	<p>Three lines spectrum <math>J &lt; a_N</math></p> <p>Three lines spectrum <math>J \ll a_N</math></p>	<p>96Han1, 96Han2</p>
<p>[C<sub>42</sub>H<sub>74</sub>N<sub>8</sub>O<sub>11</sub>]</p> 	<p>ESR / 298 Methanol (Ethanol)</p> <p>(Trifluoroethanol, Hexafluoropropanol)</p>	<p>Alternately broadened five lines spectrum <math>J \geq a_N</math></p> <p>Three lines spectrum <math>J \ll a_N</math></p>	<p>96Han1</p>
<p>[C<sub>42</sub>H<sub>74</sub>N<sub>8</sub>O<sub>11</sub>]</p> 	<p>ESR / 298 Methanol (Ethanol)</p> <p>Trifluoroethanol</p> <p>Hexafluoropropanol</p>	<p>Alternately broadened five lines spectrum <math>J \gg a_N</math></p> <p>Three lines spectrum <math>J &lt; a_N</math></p> <p>Three lines spectrum <math>J \ll a_N</math></p>	<p>96Han1</p>
<p>[C<sub>44</sub>H<sub>69</sub>BrN<sub>8</sub>O<sub>11</sub>]</p> 	<p>ESR / 298 Methanol (Ethanol)</p> <p>Trifluoroethanol</p> <p>Hexafluoropropanol</p>	<p>Alternately broadened five lines spectrum <math>J \gg a_N</math></p> <p>Three broadened lines spectrum <math>J &lt; a_N</math></p> <p>Three lines spectrum <math>J \ll a_N</math></p>	<p>96Han1</p>

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>65</sub>H<sub>115</sub>N<sub>13</sub>O<sub>15</sub>]</p> 	<p>Methanol (Ethanol) ESR / 298</p> <p>ESR / 200</p> <p>Hexafluoropropanol ESR / 298</p>	<p>Three broadened lines spectrum <math>J &lt; a_N</math></p> <p><i>Species I</i> <math>J \gg a_N</math> <i>Species II</i> <math>J &lt; a_N</math></p> <p>Three lines spectrum <math>J \approx 0</math></p>	99Mon1
<p>[C<sub>65</sub>H<sub>115</sub>N<sub>13</sub>O<sub>15</sub>]</p> 	<p>Methanol ESR / 298</p> <p>Ethanol ESR / 298</p> <p>Hexafluoropropanol ESR / 298</p>	<p>Five alternately broadened lines spectrum <math>J &gt; a_N</math></p> <p>Five alternately broadened lines spectrum <math>J \geq a_N</math></p> <p>Three lines spectrum <math>J \approx 0</math></p>	99Mon1
<p>[C<sub>65</sub>H<sub>115</sub>N<sub>13</sub>O<sub>15</sub>]</p> 	<p>Methanol (Ethanol, Hexafluoropropanol) ESR / 298</p>	<p>Three lines spectrum <math>J \approx 0</math></p>	99Mon1

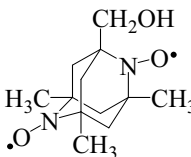
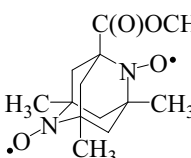
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>66</sub>H<sub>112</sub>N<sub>14</sub>O<sub>18</sub>]</p> 	<p>Methanol ESR / 298</p> <p>Ethanol (Trifluoroethanol) ESR / 298</p> <p>Hexafluoropropanol ESR / 298</p>	<p>Five alternately broadened lines spectrum <math>J &gt; a_N</math></p> <p>Five alternately broadened lines spectrum <math>J \geq a_N</math></p> <p>Three lines spectrum <math>J \approx 0</math></p>	99Pol1
<p>[C<sub>70</sub>H<sub>120</sub>N<sub>14</sub>O<sub>18</sub>]</p> 	<p>Methanol ESR / 298</p> <p>Ethanol ESR / 298</p> <p>Trifluoroethanol Hexafluoropropanol ESR / 298</p>	<p>Five alternately broadened lines spectrum <math>J \geq a_N</math></p> <p>Three broadened lines spectrum <math>J &lt; a_N</math></p> <p>Three lines spectrum <math>J \approx 0</math></p>	99Ppol1
<p>[C<sub>72</sub>H<sub>104</sub>N<sub>2</sub>O<sub>12</sub>]</p> 	<p>Synthesis outlined THF/Toluene (2:3 v/v) ESR / 298</p> <p>ESR / 233</p> <p>ESR / 193</p>	<p>Five lines spectrum 2.0060 <math>J \gg a_N</math></p> <p>Alternately broadened five lines 2.0051 <math>J \leq a_N</math></p> <p>Three lines spectrum <math>J \approx 0</math></p>	95Ara1
<p>[C<sub>73</sub>H<sub>113</sub>N<sub>13</sub>O<sub>16</sub>]</p> 	<p>Methanol PELDOR / 77</p>	<p>Spectral shape typical of a nitroxide radical in frozen solution</p>	00Mil1

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [ $\text{cm}^{-1}$ ], $E$ [ $\text{cm}^{-1}$ ], $J$ [mT]	Ref. / add. Ref.
<p>[<math>\text{C}_{79}\text{H}_{35}\text{N}_3\text{O}_2</math>]</p> 	<p>Toluene ESR / 250 to 350</p> <p>Photolysis Glassy toluene TR-ESR / 120</p>	<p>Complex spectrum consisting of a three lines signal (<math>N</math>: 1.52) and six additional lines changing position, width and intensity with temperature</p> <p>Complex absorption spectrum due to the ground triplet state and to the quintet state* (<math>D/g\beta</math>: 2.2 mT)</p>	00Con1
<p>[<math>\text{C}_{80}\text{H}_{38}\text{N}_4\text{O}_2</math>]</p> 	<p>Synthesis described Toluene ESR / 298</p> <p>Photolysis Glassy toluene TR-ESR / 10 to 80</p>	<p>Three lines spectrum 2.0063 <math>N</math>: 42.6 MHz <math>J \ll a_N</math></p> <p>Complex absorption spectrum due to the ground doublet state and to the quintet state (<math>D</math>: 60 MHz)*</p>	99Miz1
<p>[<math>\text{C}_{104}\text{H}_{144}\text{N}_2\text{O}_{20}</math>]</p>  <p><math>X = \text{OCH}_2\text{C}(\text{O})\text{OC}_2\text{H}_5</math></p>	<p>Synthesis outlined THF ESR / 298</p> <p>THF-<math>\text{Ph}_4\text{B}^-\text{M}^+</math> (where <math>M = \text{Na}, \text{K}, \text{Cs}</math>) ESR / 298</p>	<p>Three lines spectrum 2.0057 <math>J \ll a_N</math></p> <p>Alternately broadened five lines 2.0058–2.0059 <math>J \sim a_N</math></p>	95Ara1

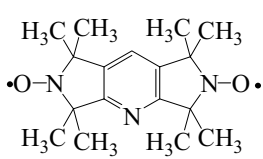
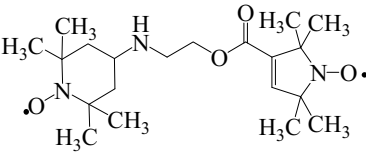
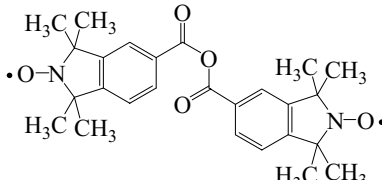
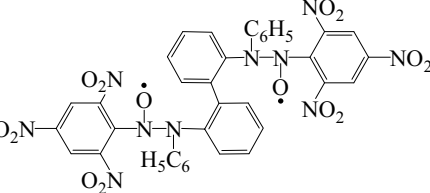
### 12.5.1.9 Bicyclic bisnitroxides

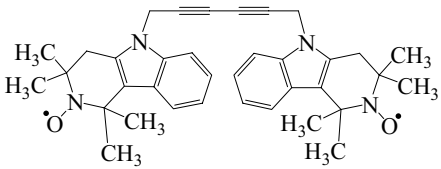
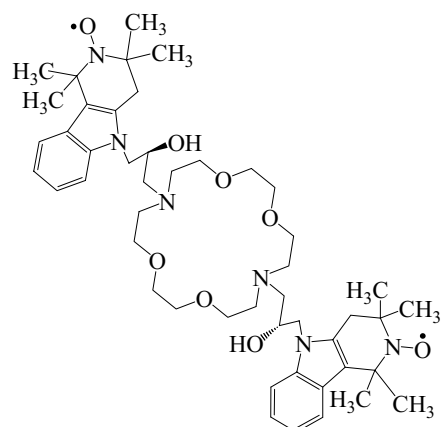
<p>[<math>\text{C}_{12}\text{H}_{20}\text{N}_2\text{O}_2</math>]</p> 	<p>Synthesis outlined Polycrystalline sample SQUID / 2 to 300</p>	<p>High temperature 2.00 <math>J</math>: 0</p> <p>Low temperature <math>2J/k_B</math>: 30.4 K</p>	92Chi1
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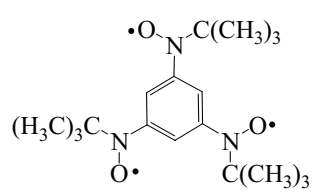
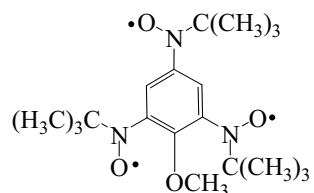
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
$[C_{12}H_{20}N_2O_3]$ 	Synthesis described Ethanol ESR / 298  Frozen solution ESR / 140	Single line spectrum $\Delta H_{pp}$ : 3.1 mT  Triplet spectrum $D$ : 22.8 mT	93Chi1
$[C_{13}H_{20}N_2O_4]$ 	Synthesis described $CH_2Cl_2$ ESR / 298  Benzene frozen solution ESR / 4	Single line spectrum $\Delta H_{pp}$ : 3.0 mT  Triplet spectrum $D$ : 23.5 mT	93Chi1

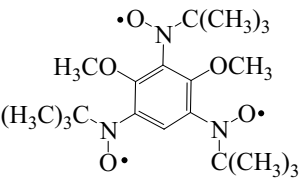
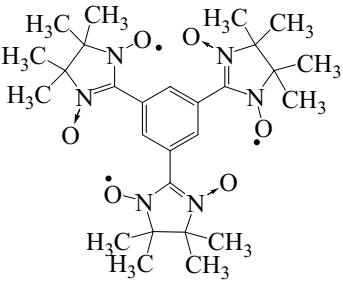
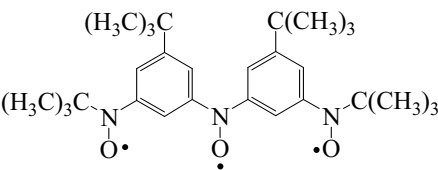
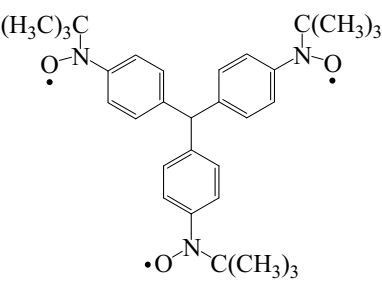
#### 12.5.1.10 Other miscellaneous bisnitroxides

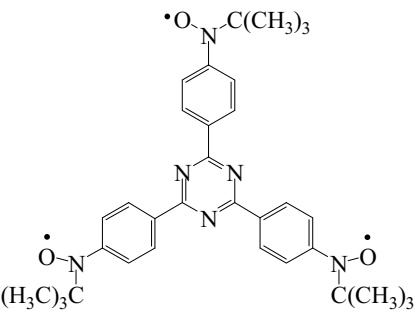
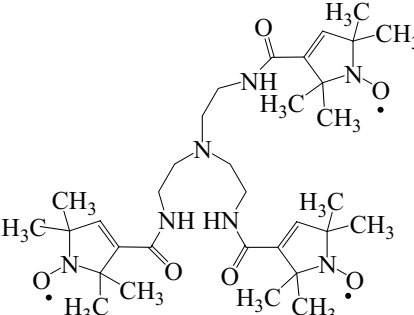
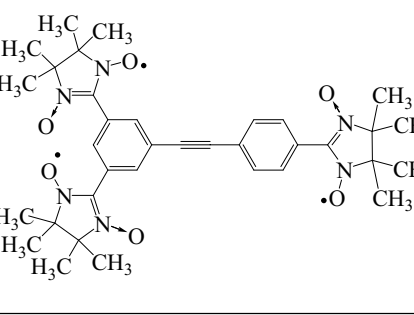
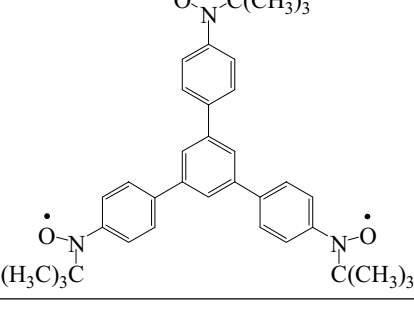
$[C_{17}H_{25}N_3O_2]$ 	Ethanol ESR / 298  Ethanol frozen solution ESR / 120	Five lines spectrum $N$ : 1.46 $J \gg a_N$  2.0093, 2.0064, 2.0020 av 2.0059 $N$ : 0.8, 0.8, 3.22 av 1.61 $D$ : 6.4 mT	95Fab1
$[C_{20}H_{35}N_2O_4]$ 	Synthesis described Benzene ESR / 298	Five lines spectrum 2.0060 $N$ : 1.45 $J > a_N$	96Dra1
$[C_{26}H_{30}N_2O_5]$ 	Synthesis described Chloroform ESR / 298	2.0059 $N$ : 1.456	00Bot1
$[C_{36}H_{22}N_{10}O_{14}]$ 	Oxidation of DPPH on $PbO_2$ surface Toluene ESR / 153	Complex spectrum due to overimposition of a doublet (DPPH) and of a Triplet ( $g$ : 2.002 <sub>2</sub> , $2D$ : 8.7 mT) signal	89Has1

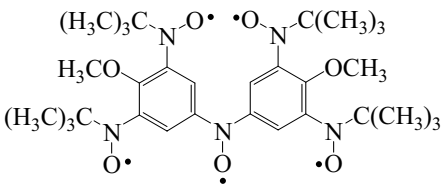
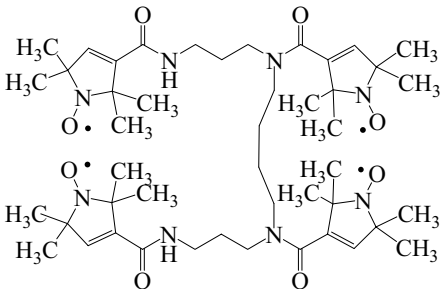
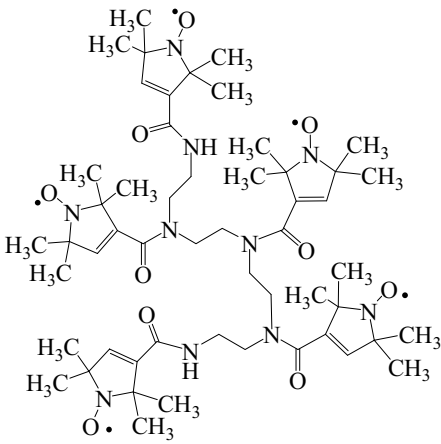
Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
$[C_{36}H_{40}N_4O_2]$ 	Synthesis outlined Toluene ESR / 298  Toluene ESR / 77	Five line spectrum $J \gg a_N$  Triplet spectrum shown	91Laz1
$[C_{48}H_{72}N_6O_8]$ 	Synthesis described Aqueous alcoholic solution (both in the absence and presence of Na <sup>+</sup> , K <sup>+</sup> , and Mg <sup>2+</sup> ions) ESR / 298  Aqueous alcoholic solution (in the presence of Ca <sup>2+</sup> , K <sup>+</sup> ions) ESR / 298	Three lines spectrum 2.003 $N$ : 1.65 $J \ll a_N$  Five lines spectrum $J > a_N$	96Sha1

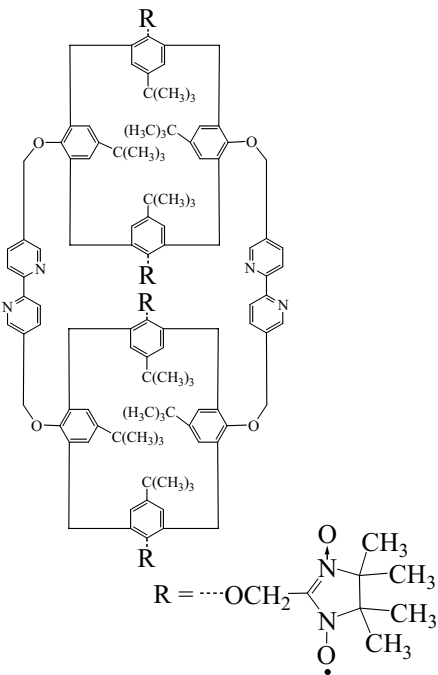
### 12.5.2 Trisnitroxides

$[C_{18}H_{30}N_3O_3]$ 	Synthesis described Toluene ESR / 298  ESR / 10	Broad signal overlapped with 12 weak lines due to coupling with three nitrogen and three hydrogen atoms 2.0062  Quartet state spectrum 2.0060 $ D $ : 0.00932 $ E $ : 0.00015	93Kan2
$[C_{19}H_{32}N_3O_4]$ 	Synthesis described Toluene ESR / 298  ESR / 10  Crystalline sample SQUID	Exchange-broadened single signal 2.0063 $\Delta H_{pp}$ : 2.0 mT  Quartet state spectrum 2.0020, 2.0029, 2.0055 $ D $ : 0.00966 $ E $ : 0.00032  $J_1/k_B$ : 68.4 K ( $N_1 \leftrightarrow N_3, N_5$ ) $J_2/k_B$ : 5.0 K ( $N_3 \leftrightarrow N_5$ )	93Kan2

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
$[C_{20}H_{34}N_3O_5]$ 	Synthesis described Toluene ESR / 298 ESR / 6.5  Crystalline sample SQUID / 2 to 350	Broad singlet 2.0064 $\Delta H_{pp}$ : 2.5 mT  2.0062, 4.019 ( $\Delta m_s = 2$ ), 6.035 ( $\Delta m_s = 3$ ) $ D $ : 0.010 $ E $ : 0.0004  $J/k_B$ : -41.46 K	96Fuj1
$[C_{27}H_{39}N_6O_6]$ 	Synthesis described Chloroform ESR	Broad complex signal indicating strong intra- molecular interaction	90Dul1, 90Dul2
$[C_{28}H_{42}N_3O_3]$ 	Synthesis outlined Solid sample ESR / 298  Benzene ESR / 298  Toluene ESR / 4.2  Faraday balance / 2 to 300	2.0055  Single line 2.0058 $\Delta H_{pp}$ : 1.4 mT  Quartet spectrum $ D $ : 0.0087 $ E $ : 0.0003 (assumed)  $J/k_B$ : 240 K	91Ish1
$[C_{31}H_{40}N_3O_3]$ 	Synthesis described Benzene ESR / 298	Seven lines spectrum 2.005 $N$ : 1.32 $J \gg a_N$	96Oni1

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>33</sub>H<sub>39</sub>N<sub>6</sub>O<sub>3</sub>]</p> 	<p>Synthesis described CH<sub>2</sub>Cl<sub>2</sub> ESR / 298</p> <p>Frozen CH<sub>2</sub>Cl<sub>2</sub></p> <p>Microcrystalline sample SQUID / 1.8 to 350</p>	<p>Seven lines spectrum 2.0061 <math>J \gg a_N</math></p> <p>2.0073</p> <p><math>J/k_B</math>: 15.3 K</p>	99Hay1
<p>[C<sub>33</sub>H<sub>54</sub>N<sub>7</sub>O<sub>6</sub>]</p> 	<p>Synthesis outlined Water ESR / 298</p>	<p>Alternately broadened seven lines spectrum N: 1.59 <math>J &gt; a_N</math></p>	95Mar1
<p>[C<sub>35</sub>H<sub>43</sub>N<sub>6</sub>O<sub>6</sub>]</p> 	<p>Microcrystalline sample SQUID / 5 to 100</p>	<p><math>J_1/k_B</math>: 23 K <math>J_2/k_B</math>: 6.6 K</p>	99Cat1
<p>[C<sub>36</sub>H<sub>42</sub>N<sub>3</sub>O<sub>3</sub>]</p> 	<p>Synthesis described MTHF ESR / 298</p> <p>Crystalline sample SQUID / 5 to 300</p>	<p>Seven lines spectrum 2.0061 N:0.885 <math>J \gg a_N</math></p> <p><math>J/k_B</math>: 5.3 K</p>	93Kan2

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [cm <sup>-1</sup> ], $E$ [cm <sup>-1</sup> ], $J$ [mT]	Ref. / add. Ref.
<b>12.5.3 Other polynitroxides</b>			
<p>[C<sub>30</sub>H<sub>46</sub>N<sub>5</sub>O<sub>7</sub>]</p> 	<p>Synthesis described Toluene ESR / 298</p> <p>Frozen toluene ESR / 6.5</p> <p>Crystalline sample SQUID / 2 to 350</p>	<p>Broad single line 2.0064 <math>\Delta H_{pp}</math>: 2.0 mT</p> <p>Sextet spectrum 2.0062, 4.019 (<math>\Delta m_s = 2</math>) <math> D </math>: 0.0039 <math> E </math>: 0.0013</p> <p><math>J</math> not determined due to strong intermolecular interactions</p>	97Fuj1
<p>[C<sub>46</sub>H<sub>74</sub>N<sub>8</sub>O<sub>8</sub>]</p> 	<p>Synthesis outlined Chloroform ESR / 298</p> <p>Intermediate exchange interaction.</p>	<p>Nine lines spectrum N: 1.55 <math>J \leq a_N</math></p>	90Bri1
<p>[C<sub>53</sub>H<sub>83</sub>N<sub>10</sub>O<sub>10</sub>]</p> 	<p>Synthesis outlined Chloroform ESR / 298</p> <p>Intermediate exchange interaction.</p>	<p>Twelve lines spectrum N: 1.55 <math>J \leq a_N</math></p>	90Bri1

Substance	Generation / Matrix or Solvent / Method / $T$ [K]	$g$ -Factor / $a$ -Value [mT], $D$ [ $\text{cm}^{-1}$ ], $E$ [ $\text{cm}^{-1}$ ], $J$ [mT]	Ref. / add. Ref.
<p>[C<sub>144</sub>H<sub>180</sub>N<sub>12</sub>O<sub>16</sub>]</p>  <p>R = ...OCH<sub>2</sub>-C(=N-O)-C(CH<sub>3</sub>)<sub>3</sub></p>	<p>Synthesis outlined Toluene – CH<sub>2</sub>Cl<sub>2</sub> ESR / 298</p>	<p>Basic five lines spectrum indicating little or no interaction between the nitroxyl groups</p>	<p>96Ulr2</p>