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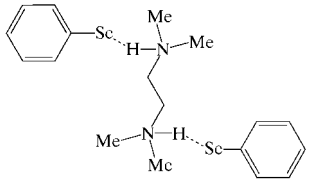
The crystal structure of the title compound, $[Me_2NHC_2H_4NHMe_2][SePh]_2$ or $C_6H_{18}N_2^{2+}\cdot 2C_6H_5Se^-$, reveals hydrogen bonding between the benzeneselenolate anions and the tetramethylethylenediammonium cations. The asymmetric unit contains one formula unit of the title compound. The two Se···H distances are 2.22 (4) and 2.34 (4) Å.

Comment

During our studies on the preparation of $[M(ER)_6]^{Z-}$ (E = S, Se), we also examined the reaction of $[ZrMe_6]^{2-}$ with benzeneselenol which afforded, in addition to the target compound, a white crystalline material. A selected crystal proved it to be the title compound, (I). A rational route to $[Me_2NHC_2H_4NHMe_2][SePh]_2$ was developed.



(I)

Experimental

Trimethylsilylphenylselenide (2.293 g, 10 mmol) was added to absolute ethanol (20 ml). After 10 min, the clear solution was treated with *N*,*N*,*N*′,*N*′-tetramethylethylenediamine (0.75 ml, 0.558 g, 5 mmol) at room temperature to give the product in 88.9% yield (m.p. 385–386 K).

Crystal data

$C_6H_{18}N_2^{2+}\cdot 2C_6H_5Se^-$	D_x = 1.46 Mg m^{-3}
M_r = 430.36	Mo $K\alpha$ radiation
Monoclinic, $P2_1/a$	Cell parameters from 10 reflections
a = 11.542 (4) Å	θ = 10–14°
b = 11.246 (5) Å	μ = 3.778 mm^{-1}
c = 15.641 (5) Å	T = 294 (2) K
β = 105.43 (3)°	Plate, colourless
V = 1957 (2) Å^3	0.25 × 0.15 × 0.05 mm
Z = 4	

Data collection

Enraf–Nonius CAD-4 diffractometer	R_{int} = 0.071
θ/θ scans	θ_{max} = 26°
Absorption correction: empirical *via* ψ scans (North *et al.*, 1968)	$h = 0 \rightarrow 14$
T_{min} = 0.381, T_{max} = 0.828	$k = 0 \rightarrow 13$
4396 measured reflections	$l = -19 \rightarrow 18$
3845 independent reflections	3 standard reflections
2768 reflections with $I > 2\sigma(I)$	frequency: 50 min
	intensity decay: 6.90%

Refinement

Refinement on F^2	All H-atom parameters refined
$R(F)$ = 0.035	$w = 1/[\sigma^2(F_o^2) + (0.0517P)^2]$ where $P = (F_o^2 + 2F_c^2)/3$
$wR(F^2)$ = 0.085	$(\Delta/\sigma)_{max}$ = 0.001
S = 1.006	$\Delta\rho_{max}$ = 0.56 e Å^{-3}
3845 reflections	$\Delta\rho_{min}$ = −0.71 e Å^{-3}
311 parameters	

Backgrounds were obtained from analysis of the scan profile (Blessing *et al.*, 1974). Refined distances involving H atoms were as follows: N—H 0.92 (4) and 0.99 (4) Å; C—H 0.82 (4)–1.06 (4) Å.

Data collection: *CAD*-4 *Operations Manual* (Enraf–Nonius, 1977); cell refinement: *CAD*-4 *Operations Manual*; data reduction: *PROCESS* in *MolEN* (Fair, 1990); program(s) used to solve structure: *MULTAN*80 (Main *et al.*, 1980); program(s) used to refine structure: *SHELXL*97 (Sheldrick, 1997); software used to prepare material for publication: *CIF VAX* in *MolEN*.

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