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The Reduction of Elemental Chalcogens and Their Derivatives by Divalent Lanthanide Complexes



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A standard periodic table of elements is displayed, showing groups 1 through 18. Elements are color-coded by group: 1A (green), 2A (blue), 3A (light green), 4A (yellow), 5A (orange), 6A (red), 7A (purple), and 18A (pink). Transition metals (Groups 3-12) are in grey, and the noble gases (Group 18) are in light blue.

1 IA	2 IIA															18 VIIA				
1 H	2 Be															1 He				
2 Li	3 Na	4 Ca	5 Sc	6 Ti	7 V	8 Cr	9 Mn	10 Fe	11 Co	12 Ni	13 Cu	14 Zn	15 Ga	16 Ge	17 As	18 Se	1 Ne			
3 K	4 Rb	5 Sr	6 Y	7 Zr	8 Nb	9 Mo	10 Tc	11 Ru	12 Rh	13 Pd	14 Ag	15 Cd	16 In	17 Sn	18 Sb	19 Te	2 Ar			
4 Ca	5 Sr	6 Ba	7 Cs	8 Ra	9 Hf	10 Ta	11 W	12 Re	13 Os	14 Ir	15 Pt	16 Au	17 Hg	18 Tl	19 Pb	20 Bi	21 Po	22 At	23 Rn	24 Xe
5 Sc	6 Y	7 Zr	8 Nb	9 Mo	10 Tc	11 Ru	12 Rh	13 Pd	14 Ag	15 Cd	16 In	17 Sn	18 Sb	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He
6 Ti	7 V	8 Cr	9 Mn	10 Fe	11 Co	12 Ni	13 Cu	14 Zn	15 Ga	16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne
7 V	8 Cr	9 Mn	10 Fe	11 Co	12 Ni	13 Cu	14 Zn	15 Ga	16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar
8 Cr	9 Mn	10 Fe	11 Co	12 Ni	13 Cu	14 Zn	15 Ga	16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He
9 Mn	10 Fe	11 Co	12 Ni	13 Cu	14 Zn	15 Ga	16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He
10 Fe	11 Co	12 Ni	13 Cu	14 Zn	15 Ga	16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He
11 Co	12 Ni	13 Cu	14 Zn	15 Ga	16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He
12 Ni	13 Cu	14 Zn	15 Ga	16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He
13 Cu	14 Zn	15 Ga	16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He	33 He
14 Zn	15 Ga	16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He	33 He	34 He
15 Ga	16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He	33 He	34 He	35 He
16 Ge	17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He	33 He	34 He	35 He	36 He
17 As	18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He	33 He	34 He	35 He	36 He	37 He
18 Se	19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He	33 He	34 He	35 He	36 He	37 He	38 He
19 Te	20 I	21 Br	22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He	33 He	34 He	35 He	36 He	37 He	38 He	39 He
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22 Kr	23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He	33 He	34 He	35 He	36 He	37 He	38 He	39 He	40 He	41 He	42 He
23 Xe	24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He	33 He	34 He	35 He	36 He	37 He	38 He	39 He	40 He	41 He	42 He	43 He
24 Rn	25 He	26 Ne	27 Ar	28 He	29 He	30 He	31 He	32 He	33 He	34 He	35 He	36 He	37 He	38 He	39 He	40 He	41 He	42 He	43 He	44 He
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27 Ar	28 He	29 He	30 He	31 He	32 He	33 He	34 He	35 He	36 He	37 He	38 He	39 He	40 He	41 He	42 He	43 He	44 He	45 He	46 He	47 He
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List of content

1 Introduction.....	1
1.1 Chalcogen.....	1
1.1.1 General	1
1.1.2 Physical and Chemical Properties	2
1.2 Rare earth elements.....	4
1.2.1 General	4
1.2.2 Physical and chemical properties	5
1.3 Lanthanide chalcogenide complexes derived from the reduction of chalcogen(ide)s by divalent lanthanide complexes	7
2 Aim of the project	13
3 Results and discussion	14
3.1 Polysulfide coordination clusters of the lanthanides.....	14
3.1.1 Synthesis	15
3.1.2 Structure.....	18
3.1.3 NIR analysis.....	22
3.2 Synthesis of dinuclear chalcogenides from the reduction of chalcogens by <i>N,N'</i> -chelating ligand supported low-valent metal complexes	24
3.2.1 Synthesis	25
3.2.2 Structure	27
3.3 Synthesis of lanthanide (Sm, Yb) aryl chalcogenides by redox reactions.....	34
3.3.1 Synthesis	35
3.3.2 Crystal structures.....	38
3.3.3 IR analysis.....	46
4 Experimental sections	48
4.1 General considerations	48
4.2 Synthesis of polysulfide clusters.....	48
4.2.1 Synthesis of [(DippForm) ₃ Sm ₃ S ₁₂ (THF) ₂] (1)	48
4.2.2 Synthesis of [(DippForm) ₃ Yb ₃ S ₁₂ (THF) ₂]·2(C ₇ H ₈)·S ₈ (2).....	50
4.2.3 Synthesis of [(DippForm) ₂ YbCl(THF)] (3)	50
4.3 Synthesis of dinuclear chalcogenides.....	51
4.3.1 General procedure for the Synthesis of [{(DippForm) ₂ LnE} ₂] (4-6)	51
4.3.2 General procedure for the Synthesis of [(DippNafnaf)FeE] ₂] (7-9)	52
4.4 Synthesis of lanthanide (Sm, Yb) aryl chalcogenides	53
4.4.1 General procedure for the Synthesis of [(DippForm) ₂ Ln(EPH)(THF)] (10-15)	53
5 Crystal structure measurements	56
5.1 Data collection and refinement	56
5.2 Crystal Data.....	58
5.2.1 [(DippForm) ₃ Sm ₃ S ₁₂ (THF) ₂]·2(C ₇ H ₈)·S ₈ (1 Method A).....	58
5.2.2 [(DippForm) ₃ Sm ₃ S ₁₂ (THF) ₂]·3(C ₇ H ₈) (1 Method B).....	59
5.2.3 [(DippForm) ₃ Yb ₃ S ₁₂ (THF) ₂]·2(C ₇ H ₈)·S ₈ (2)	60
5.2.4 [(DippForm) ₂ YbCl(THF)] (3)	61
5.2.5 [{(DippForm) ₂ SmSe} ₂]·0.5(C ₇ H ₈) (4)	62



5.2.6 [{(DippForm) ₂ SmTe} ₂]·(C ₇ H ₈) (5)	63
5.2.7 [{(DippForm) ₂ YbSe} ₂]·(C ₇ H ₈) (6).....	64
5.2.8 [{(DippNafnaf)FeS} ₂] (7)	65
5.2.9 [{(DippNafnaf)FeSe} ₂] (8).....	66
5.2.10 [{(DippNafnaf)FeTe} ₂]·(C ₇ H ₈) (9)	67
5.2.11 [(DippForm) ₂ Sm(SPh)(THF)] (10)	68
5.2.12 [(DippForm) ₂ Yb(SPh)(THF)]·(C ₇ H ₈) (11).....	69
5.2.13 [(DippForm) ₂ Sm(SePh)(THF)]·(C ₇ H ₈) (12)	70
5.2.14 [(DippForm) ₂ Yb(SePh)(THF)]·(C ₇ H ₈) (13).....	71
5.2.15 [(DippForm) ₂ Sm(TePh)(THF)]·(C ₇ H ₈) (14)	72
5.2.16 [(DippForm) ₂ Yb(TePh)(THF)]·(C ₇ H ₈) (15).....	73
5.2.17 [(DippForm) ₂ Sm(SeC ₆ F ₅)(THF)]·(C ₆ H ₁₂) (16).....	74
5.2.18 [(DippForm) ₂ Yb(SeC ₆ F ₅)]·0.5(C ₆ H ₁₂) (18)	75
5.2.19 [(DippForm) ₂ Sm(SeC ₆ F ₄ OMe)(THF)]·(C ₆ H ₁₂) (19)	76
5.2.20 [(DippForm) ₂ Yb(SeC ₆ F ₄ OMe)(THF)] (20)	77
5.2.21 [(DippForm) ₂ Yb(SeC ₆ F ₄ OMe)] (21).....	78
5.2.22 (BBED ₂ Sm ₂) (22).....	79
5.2.23 [BABCD{SmI(BTSA)(THF)} ₂] (23).....	80
5.2.24 [BAPCD{Sm(BTSA) ₂ } ₂] (24)	81
6 Summary	82
6 Zusammenfassung	85
7 References.....	88
8 Appendix	95
8.1 Preliminary Results	95
8.1.1 Synthesis	95
8.1.2 Structure	97
8.2 Directory of abbreviations.....	100
8.3 NMR abbreviations	101
8.4 IR abbreviations	101
8.5 Directory of compounds.....	101
9 Acknowledgements	103
10 Curriculum Vitae.....	105
11 Publications.....	106