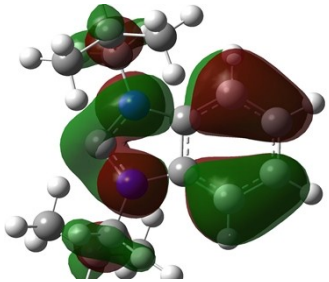
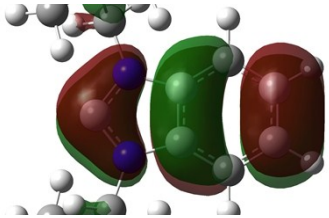
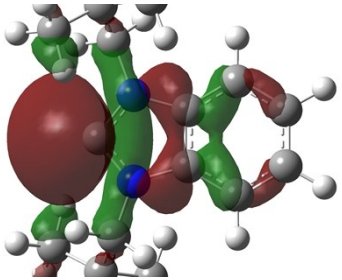
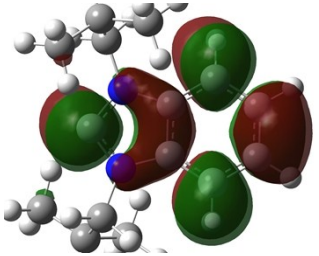
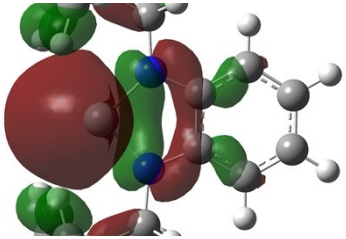
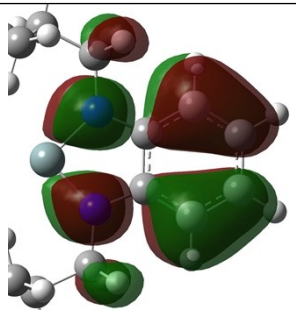
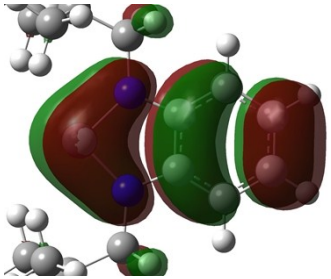
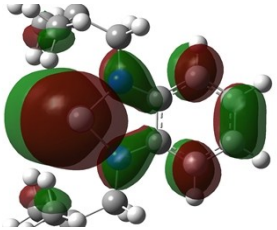
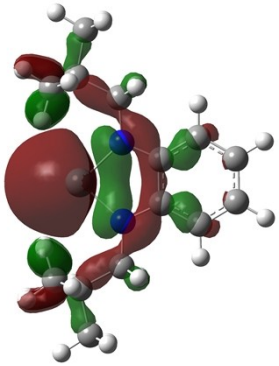
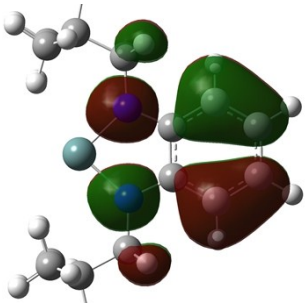
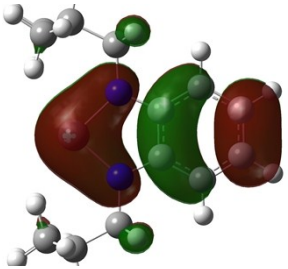
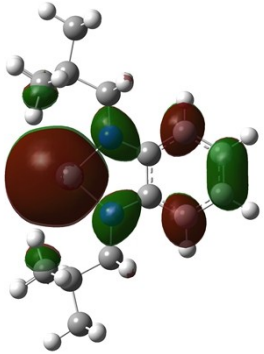
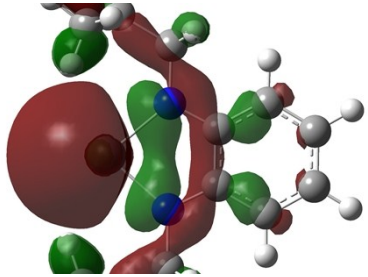
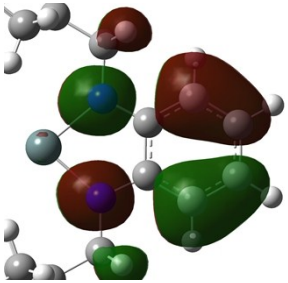
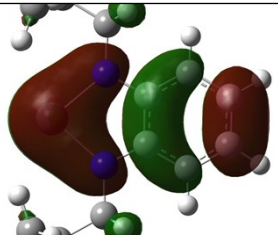
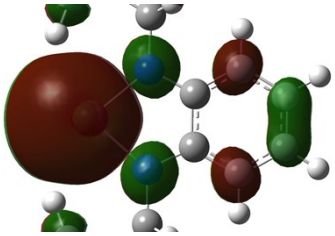
Table S1. Experimental and calculated* (PBE0) geometry parameters for IIIC-Pb.

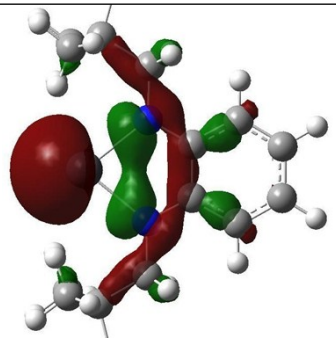
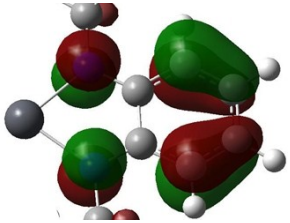
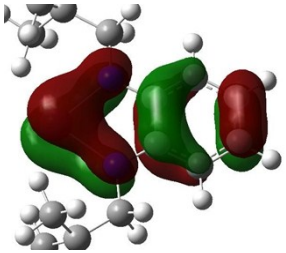
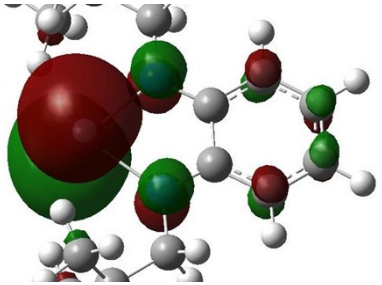
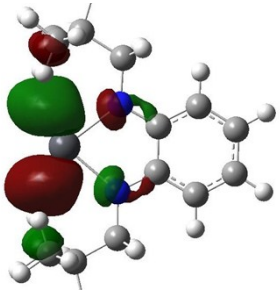
E	**III$_C$** [11]	**III$_{Si}$** [12]	**III$_{Ge}$** [10c]	**III$_{Sn}$** [13]	III$_{Pb}$ [14]	*o*-$C_6H_4(NHMe)_2$
El–N_1	1.361(2)	1.752(3)	1.861(3)	2.051(5)	2.180(4)	
El–N_2	1.374(2)	1.747(3)	1.866(3)	2.067(5)	2.180(4)	
	1.363	*1.768*	*1.876*	*2.068*	*2.210*	
N_1–C_1	1.397(2)	1.385(5)	1.393(5)	1.382(8)	1.373(7)	
N_2–C_6	1.388(2)	1.380(5)	1.391(5)	1.376(7)		
	1.390	*1.389*	*1.383*	*1.397*	*1.401*	*1.40*
C_1–C_6	1.395(2)	1.417(5)	1.433(9)	1.433(10)	1.441(10)	
	1.400	*1.411*	*1.417*	*1.427*	*1.447*	*1.42*
C_1–C_2	1.390(2)	1.395	1.399(8)	1.397(10)	1.416(7)	
C_5–C_6	1.382(2)	1.392	1.397(10)	1.398	1.416(7)	
	1.390	*1.394*	*1.398*	*1.404*	*1.419*	*1.39*
C_2–C_3	1.369(2)	1.373	1.382(11)	1.379(10)	1.371(7)	
C_4–C_5	1.376(2)	1.382	1.379(11)	1.382	1.371(7)	
	1.389	*1.391*	*1.390*	*1.391*	*1.390*	*1.39*
C_3–C_4	1.390(3)	1.374	1.371(11)	1.371(11)	1.440(10)	
	1.399	*1.391*	*1.391*	*1.393*	*1.399*	*1.38*
N_1–El–N_2	103.49(13)	88.2(1)	84.9(1)	78.49	75.8(2)	
	107.07	*89.05*	85.68	*80.79*	*77.41*	
El–N_1–C_1	112.36(13)	111.9(3)	114.0(2)	115.32	115.3(3)	
El–N_2–C_6	112.80(12)	111.3(3)	114.2(2)	115.07	115.3(3)	
	112.32	*112.88*	*112.97*	*112.95*	*113.29*	
N_1–C_1–C_6	106.17(14)	111.92	115.2(5)	115.10	116.4(3)	
N_2–C_6–C_1	105.73(14)	111.33	115.1(5)	115.16	116.4(3)	
	105.63	*112.60*	*114.19*	*116.65*	*118.01*	

*marked by italics

Table S2 Frontier MOs for **III** at PBE0 level.

El=	HOMO[-2]	HOMO[-1]	HOMO	LUMO
III_C	 1(p)+2(s)%*	 13(p)%	 50(s)+42(p)%	 19(p)%
III_{Si}	 58(s)+26(p)%	 0%	 14(p)%	 68(p)%

III_{Ge}	 47(s)+ 19(p) %	 0%	 17(p)%	 73(p)%
III_{Sn}	 36(s)+25(p)%	 0%	 19(p)%	 70(p)+3(d)%

III_{Pb}					
	22 % (p) + 19%(s)	0	22% (p)	66% (p)	78% (p)

* The AOs contribution of E^{II} atom for each type

Table S3 Experimental and calculated (in brackets) frequencies (cm^{-1}) of prominent Raman lines.

IIIa C	IIIb Si	IIIc Ge	IIId Sn	IIIe Pb	assignment
767 vs* (759)	702 vs (649)	670 vs (613)	647 vs (619)	629 vs (615)	«breathing» of both rings with some contribution from the N–E^{II} bonds
2 s (1013)	1033 s (1036)	1034 s (1041)	1036 s (1056)	1037 s (1059)	#3 (Fig. 4)
1182 s (1166)	1132 s (1130)	1117 s (1112)	1094 s (1186)	1082 s (1076)	complex mode
1272 sm (1314?)	1275 sm (1276)	1279 sm (1284)	1272 sm (1251)	1269 sm (1270)	complex mode $\nu(C_{ar}N)+\delta CH$
1386 s (1349)	1365 s (1367)	1360 s (1386)	1359 s (1377)	1361 s (1376)	complex mode $\nu(CC)_{ar}+\delta CH$
1446 w	1475 (1455)	1471 m (1460)	1473 s (1480)	1472 (1484)	complex mode $\nu(CC)_{ar}+\delta CH$ $+\nu CN$
1606 sm (1595s, 1596 as)	1579 sh, 1587 (1573s, 1580as)	1568 sh, 1581 (1562s, 1577as)	1550, 1556 (1556s, 1577as)	1542, 1550 sh (1550s, 1575as)	#1, #2 (Fig. 4)

* - relative intensities

Fig. S1 ACID isosurface plotted for silylene $\mathbf{III_{Si}}$ at isovalue 0.06.

Fig. S2 ACID isosurface plotted for stannylene **III$_{Sn}$** at isovalue 0.02.

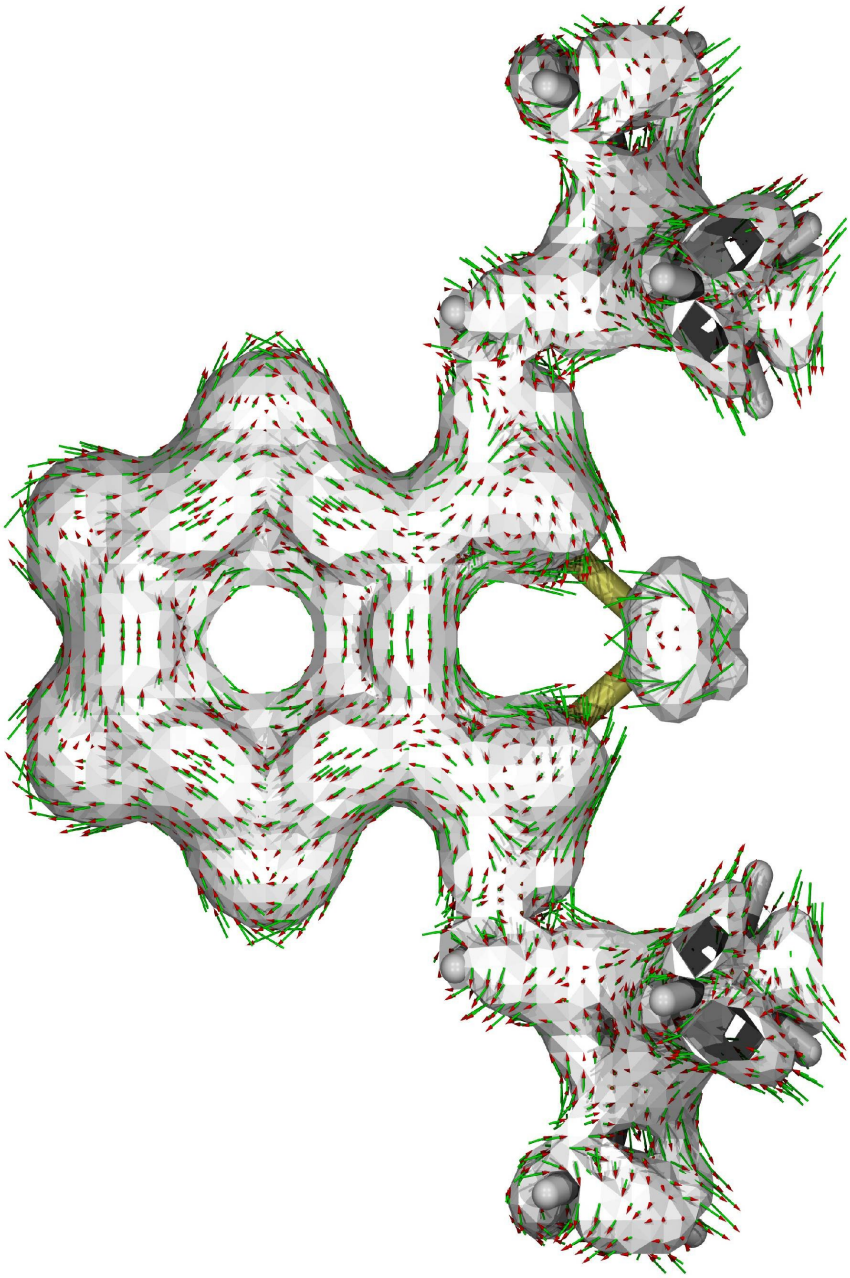


Fig. S3 ACID isosurface plotted for plumbylene **III$_{Pb}$** at isovalue 0.02.

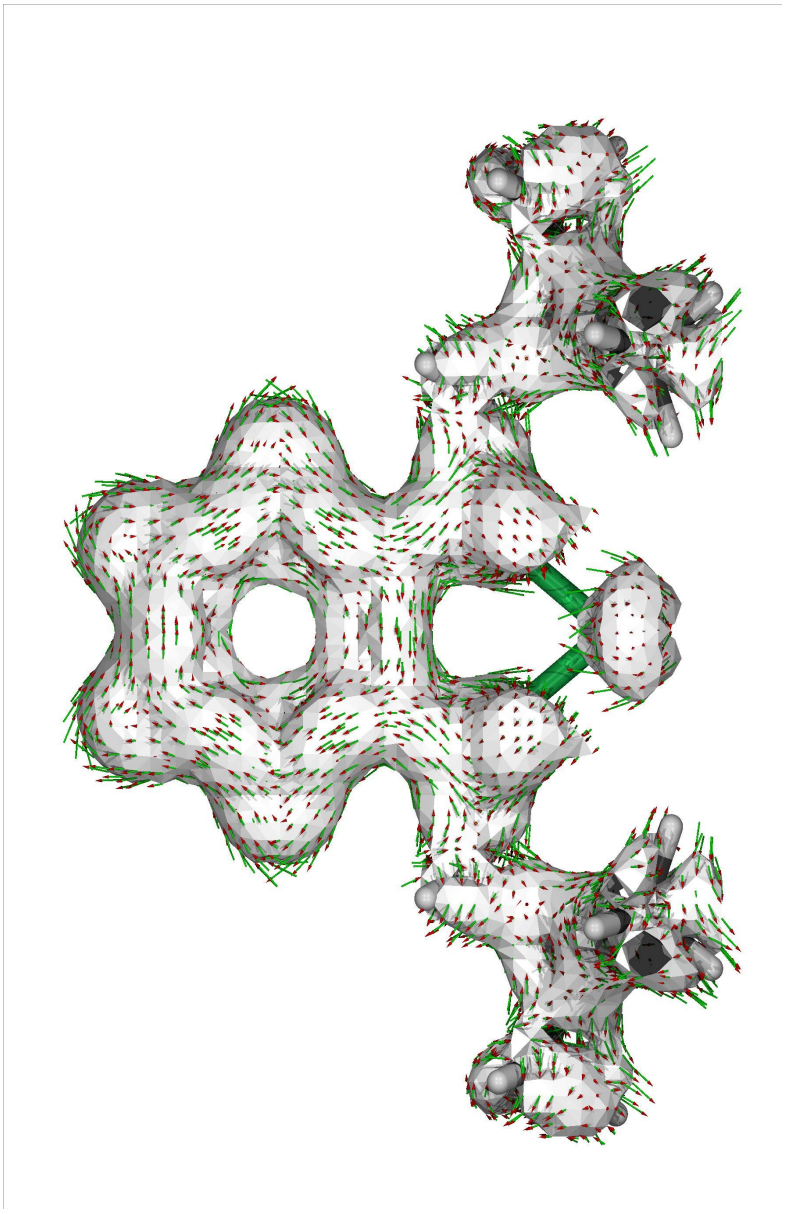


Fig. S4 ACID isosurface plotted for carbene $\mathbf{II_C}$ at isovalue 0.05.

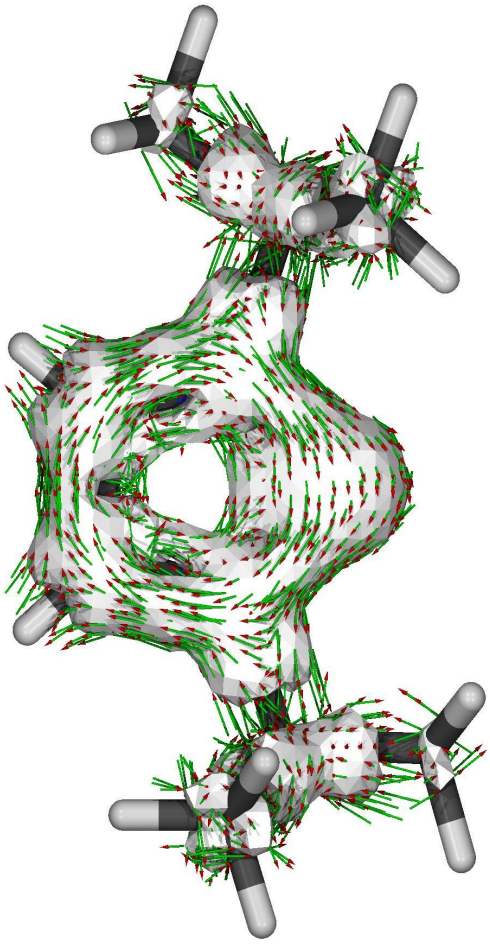


Fig. S5 ACID isosurface plotted for silylene $\mathbf{II}_{\mathbf{Si}}$ at isovalue 0.05.