

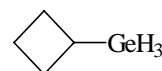
1809
MW

C₄H₁₀Ge

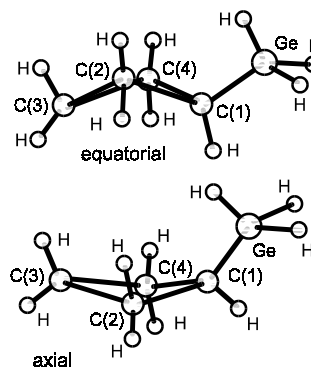
Cyclobutylgermane
Germylcyclobutane

C_s (equatorial)
C_s (axial)

r_0	Å	Å	Å
	equatorial		axial
C(1) ^{a)}	1.109(5)		1.130(4)
C(2) ^{a)}	1.088(0)		1.090(1)
C–C	1.553(3)		1.570(3)
Ge–H		1.529 ^{b)}	
C–H		1.090 ^{b)}	
C–Ge		1.947 ^{b)}	



θ_0	deg	deg	deg
	equatorial		axial
H–Ge–C	112.0(2)		109.1(9)
C(2)–C(1)–C(4)	88.9(3)		87.9(2)
C(1)–C(2)–C(3)	87.9(3)		90.0(6)
H–Ge–H	106.8(3)		109.8(9)
H–C(2,4)–H		122 ^{b)}	
H–C(3)–H		110 ^{b)}	
$\phi(\text{Ge}-(\text{C}(2)\text{C}(1)\text{C}(4)))$	132.3(7)		122(1)
$\theta^c)$	27(2)		–21(2)



^{a)} Represents the distance from the C atom shown to the midpoint between the C(2,4) where $r(\text{C}(3))$ is equal to $r(\text{C}(1))$.

^{b)} Assumed.

^{c)} Puckering angle.

Durig, J.R., Geyer, T.J., Groner, P., Dakkouri, M.: Chem. Phys. **125** (1988) 299.

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r_a	Å ^{a)}	θ_a	deg ^{a)}
C(1)–C(2)	1.557(3)	C(2)–C(1)–C(4)	89.6(7)
C(2)–C(3)	1.558 ^{b)}	C(1)–Ge–H(eq)	103.7(29)
Ge–C	1.948(4)	C(1)–Ge–H(ax)	110 ^{b)}
C–H	1.085(4)	H–C–H	105.9(32)
Ge–H	1.513(8)	ϕ (eq) ^{c)}	131.2(11)
		ϕ (ax) ^{c)}	126.4(19)
		θ (eq) ^{d)}	25.3(31)
		θ (ax) ^{d)}	–20.4(36)

The molecule consists of quasi-equatorial and quasi-axial conformers, the former being predominant (77(3)%), $\Delta G = 3.1$ (1) kJ mol^{–1}.

The nozzle temperatures were 10 and 20 °C.

^{a)} Three times the estimated standard errors including a systematic error.

^{b)} Assumed.

^{c)} The angle between the Ge–C(1) bond and the C(2)C(1)C(4) plane.

^{d)} Puckering angle.

Dakkouri, M.: J. Mol. Struct. **130** (1985) 289.