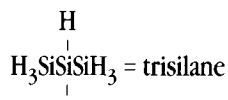
NAMING SILICON COMPOUNDS

Silane, SiH_4, is the simplest hydride and provides the basis of nomenclature for all silicon chemistry. Compounds are named as derivatives of silane with the substituents prefixed, e.g., trichlorosilane, $HSiCl_3$; disilane, H_3SiSiH_3; methyldichlorosilane, $CH_3SiH(Cl_2)$; methylsilane, CH_3SiH_3; diethylsilane, $(C_2H_5)_2SiH_2$; and triethylsilane, $(C_2H_5)_3SiH$. Two or more substituents are listed alphabetically with substituted organic moieties being named first, followed by simple organic fragments. Alkoxy substituents are named next, followed by acyloxy, halogen, and pseudohalogen groups; for example, ethylmethylethoxysilane, $C_2H_5(CH_3)SiH(OC_2H_5)$, and (3-chloropropyl) methylchlorosilane, $ClCH_2CH_2CH_2SiH(CH_3)Cl$. Organosilanes have also been referred to as organosilicon hydrides and organohydrosilanes. This broad classification is based on comparison of the electronegativities of silicon and hydrogen. With systems containing silicon-silicon bonds, compounds are named as derivatives of disilane, trisilane etc.

SiH_4 = silane

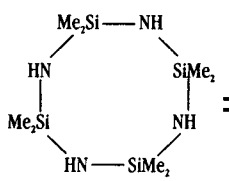
H_3SiSiH_3 = disilane



= trisilane

Silazanes are named as disilazane, trisilazane and so forth depending on the number of silicon atoms in the structure.

$H_3SiNHSiH_2NHSiH_3$ = trisilazane



= 1,1,3,3,5,5,7,7-octamethylcyclotetrasilazane

Siloxanes are named in a similar fashion to the silazanes.

$H_3Si\text{-}O\text{-}SiH_3$ = disiloxane

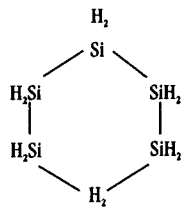
$Me_3Si\text{-}O\text{-}SiMe_3$ = hexamethyldisiloxane

$Me_3Si\text{-}O\text{-}SiMe_2\text{-}O\text{-}SiMe_2CH{=}CH_2$ = 1-vinylheptamethyltrisiloxane

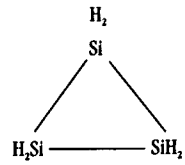
When the silicon group must be named as a unit the following general names are used:

H_3Si-	silyl
H_2Si-	silylene
H_3SiSiH_2-	disilanyl
H_3SiO-	Siloxanyl
Me_3Si-	trimethylsilyl
$tBuMe_2Si$-	tert-butyldimethylsilyl
Me_3SiO-	trimethylsiloxy

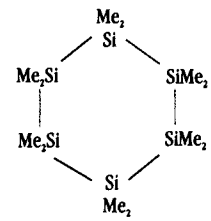
The cyclic silanes are named:



cyclohexasilane



cyclopropasilane



dodecamethylcyclohexasilane

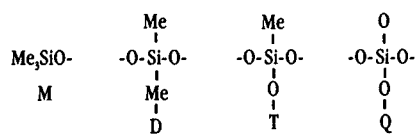
Hydroxy derivatives are named as silanols:

H_3SiOH	silanol
$H_2Si(OH)_2$	silane diol
$PhSi(OH)_3$	phenylsilane triol
Ph_3SiONa	sodium triphenylsilanolate

When the question of whether to use organic or organosilicon nomenclature arises, the tendency is to employ the organic nomenclature.

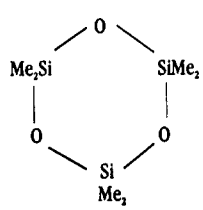
Me_3SiCH_2CN	α -trimethylsilylacetonitrile
$Me_3SiCHClCH_3$	1-trimethylsilyl-1-chloroethane or (1-chloroethyl)trimethylsilane
$Me_3SiCH(OH)CH_3$	1-trimethylsilylethanol
$PhCO_2SiEt_3$	triethylsilylbenzoate

A shorthand notation for the methylsiloxanes and polymethylsiloxanes. The various groups utilized in this format are:



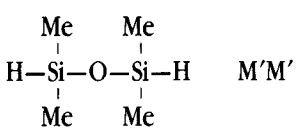
Examples are:

$Me_3Si\text{-}O\text{-}SiMe_3$	MM
$Me_3Si(OSiMe_2)_{10}OSiMe_3$	$MD_{10}M$
$(Me_3SiO)_3Si\text{-}O\text{-}SiMe_2\text{-}OSiMe_3$	M_3QDM



D_3

In cases where the substituent is not methyl a prime(′) designation is used. Thus tetramethyldisiloxane is



M′M′