

TABLE 3.15
Some bond-stretching force constants†

Bond	Force constant, mdyn Å ⁻¹	Bond	Force constant, mdyn Å ⁻¹
N ₂	22.6	F ₂	4.5
CO	18.7	Cl ₂	3.2
HC≡CH	15.7	Br ₂	2.4
P ₂	5.5	I ₂	1.7
As ₂	4.0	HgCl ₂	2.11
O ₂	11.4	HgCl ₃ ⁻	1.27
H ₂ C≡CH ₂	9.6	HgCl ₄ ²⁻	0.82
OC=S	7.5	GeCl ₄	3.27
H ₂	5.1	GaCl ₄ ⁻	2.50
CH ₄	5.0	ZnI ₄ ²⁻	1.64
NH ₃	6.4	MnCl ₄ ²⁻	1.39
PH ₃	3.2	MnBr ₄ ²⁻	1.16
KH	0.53	MnI ₄ ²⁻	0.92
LiI	0.77	TiCl ₆ ²⁻	1.13
PCl ₃	2.1	ZrCl ₆ ²⁻	0.88
PBr ₃	1.6	HfCl ₆ ²⁻	0.86
Na ₂	1.7	PtCl ₆ ²⁻	1.86
NO	15.5		
HF	8.8		
HCl	4.8		
HBr	3.8		
HI	2.9		

† Data from T. L. Cottrell, "The Strengths of Chemical Bonds," 2d ed., Butterworth, London, 1958; and A. Finch, P. N. Gates, K. Radcliffe, F. N. Dickson, and F. F. Bentley, "Chemical Applications of Far Infrared Spectroscopy," Academic, London, 1970.

Representative Bond Stretch Force Constants