

	Acid	Conj. Base	pKa	Comment
Increasing Acid Strength ↑	SO ₃ / FSO ₃ H/SbF ₅	SbF ₆ ⁻	-??	Super Acids all too strong to measure
	HF / SbF ₅	SbF ₆ ⁻		
	F ₃ CSO ₃ H	F ₃ CSO ₃ ⁻		
	HClO ₄	ClO ₄ ⁻	-10	
	HI	I ⁻	-10	
			-10	protonated aldehydes
	H ₂ SO ₄	HSO ₄ ⁻	-9	sulfuric acid
	HBr	Br ⁻	-9	hydrobromic acid
			-7	protonated esters
	HCl	Cl ⁻	-7	hydrochloric acid
			-7	protonated carboxylic acids
			-7 to -6	protonated ketones
			-7	sulfonic acids
			-6	protonated phenols
			-3	protonated ethers
		-2	protonated alcohols	
H ₃ O ⁺	H ₂ O	-1.74	hydronium; H ⁺ (aq)	
HNO ₃	NO ₃ ⁻	-1.4	nitric acid	
HSO ₄ ⁻	SO ₄ ²⁻	1.99	second H of sulfuric acid	
H-F	F ⁻	3.18	hydrofluoric acid	
HNO ₂	NO ₂ ⁻	3.3	nitrous acid	
		-6 to +5	anilines; pKa very sensitive to ring substituents	

Increasing Base Strength ↓

	Acid	Conj. Base	pKa	Comment
Increasing Acid Strength ↑			4.0 to 5.0	carboxylic acids
	H ₂ CO ₃	HCO ₃ ⁻	6.35	carbonic acid
	H ₂ S	HS ⁻	7.00	hydrogen sulfide
			9.00	2,4-pentandione
	NH ₄ ⁺	NH ₃	9.24	ammonium ion
			4-11	depends on substitution plain phenol has a pKa=10
	R-CH ₂ -NO ₂	R-CH ⁻ -NO ₂	10.0	aliphatic nitro
	HCO ₃ ⁻	CO ₃ ⁻	10.3	bicarbonate
			11.0	ethyl acetoacetate
			13.0	diethyl malonate
	H-O-H	OH ⁻	15.7	water pKa
			16.0	cyclopentadiene: World's Strongest Carbon Acid!!
			17.0	amides
	R-OH	R-O ⁻	16-19	alcohols, ethanol pKa = 16
			20-21	alpha H of ketones
			25	alpha H of esters
	R-CH ₂ -CN	R-CH ⁻ -CN	25	alpha to nitrile
	R-C≡C-H	R-C≡C ⁻	25	terminal alkynes. The electrons are in an sp hybridized orbital

Increasing Base Strength ↓

	Acid	Conj. Base	pKa	Comment
Increasing Acid Strength			18–28	anilines; pKa Depends on substitution. Low because it has a conjugated base. Plain aniline has pKa =25
			35	benzyl hydrogens; conjugated base
	H ₂	H ⁻	35	hydrogen gas is a weak acid
			36	allyl hydrogens; conjugated conjugate base.
	((CH ₃) ₂ CH) ₂ NH	((CH ₃) ₂ CH) ₂ N ⁻	36	amines: NH ₃ pKa=38
			43	vinyl hydrogens; electrons in unconjugated sp ² orbital
			44	phenyl hydrogens; electrons in unconjugated sp ² orbital, not part of aromatic π sextet
			46	cyclopropane H; more vinyl than sp ³ hybrid (see below.)
			50	methane and hydrogens on sp ³ carbons
			52	cyclohexyl; weakest acid on this table. sp ³ conj. base