

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

Increasing Base Strength ↓

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Increasing Acid Strength ↑			4.0 to 5.0	carboxylic acids
	H <sub>2</sub> CO <sub>3</sub>	HCO <sub>3</sub> <sup>-</sup>	6.35	carbonic acid
	H <sub>2</sub> S	HS <sup>-</sup>	7.00	hydrogen sulfide
			9.00	2,4-pentandione
	NH <sub>4</sub> <sup>+</sup>	NH <sub>3</sub>	9.24	ammonium ion
			4-11	depends on substitution plain phenol has a pKa=10
	R-CH <sub>2</sub> -NO <sub>2</sub>	R-CH <sup>-</sup> -NO <sub>2</sub>	10.0	aliphatic nitro
	HCO <sub>3</sub> <sup>-</sup>	CO <sub>3</sub> <sup>-</sup>	10.3	bicarbonate
			11.0	ethyl acetoacetate
			13.0	diethyl malonate
	H-O-H	OH <sup>-</sup>	15.7	water pKa
			16.0	cyclopentadiene: World's Strongest Carbon Acid!!
			17.0	amides
	R-OH	R-O <sup>-</sup>	16-19	alcohols, ethanol pKa = 16
			20-21	alpha H of ketones
			25	alpha H of esters
	R-CH <sub>2</sub> -CN	R-CH <sup>-</sup> -CN	25	alpha to nitrile
	R-C≡C-H	R-C≡C <sup>-</sup>	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.
			43	vinyl hydrogens; electrons in unconjugated sp <sup>2</sup> orbital
			44	phenyl hydrogens; electrons in unconjugated sp <sup>2</sup> orbital, not part of aromatic π sextet
			46	cyclopropane H; more vinyl than sp <sup>3</sup> hybrid (see below.)
			50	methane and hydrogens on sp <sup>3</sup> carbons
			52	cyclohexyl; weakest acid on this table. sp <sup>3</sup> conj. base