

## Equilibrium pKa Table (DMSO Solvent and Reference)

## Ketones

X = H	26.5 <sup>52</sup>
Ph	19.8 <sup>58</sup>
OMe	24.6 <sup>27</sup>
SPh	18.7
COCH <sub>3</sub>	13.3
S(O)Ph	15.1
SO <sub>2</sub> Ph	12.5 <sup>58</sup>
<sup>+</sup> NMe <sub>3</sub>	16.3 <sup>44</sup>
<sup>+</sup> Py	11.8 <sup>44</sup>

Ar = Ph	24.7 <sup>1</sup>
2-Py	23.6
4-Py	21.8
2-Furyl	23.9
2-Thienyl	24.0

X = H	24.7 <sup>52</sup>
Me	24.4 <sup>58</sup>
Ph	17.7 <sup>58</sup>
COMe	14.2 <sup>58</sup>
COPh	13.4 <sup>42</sup>
C≡N	10.2 <sup>6</sup>
F	21.7 <sup>52</sup>
OPh	21.1 <sup>34</sup>
OMe	22.9 <sup>34</sup>
NPh <sub>2</sub>	20.3
NMe <sub>2</sub>	23.6 <sup>57</sup>
<sup>+</sup> NMe <sub>3</sub>	14.6 <sup>6</sup>
<sup>+</sup> Py	10.7 <sup>44</sup>
NO <sub>2</sub>	7.7 <sup>6</sup>
SPh	17.1 <sup>35</sup>
SO <sub>2</sub> Ph	11.4 <sup>6</sup>
SePh	18.6 <sup>5</sup>

X = H	24.7 <sup>1</sup>
p-Me	25.2
p-Ph	24.5
p-OMe	25.7 <sup>50</sup>
m-OMe	24.5 <sup>50</sup>
p-NMe <sub>2</sub>	27.5 <sup>50</sup>
m-NMe <sub>2</sub>	25.3 <sup>50</sup>
p-F	24.5 <sup>50</sup>
m-F	23.5 <sup>50</sup>
p-Cl	23.8 <sup>50</sup>
m-Cl	23.2 <sup>50</sup>
p-Br	23.8 <sup>50</sup>
p-SPh	23.8 <sup>50</sup>
p-S(O)Ph	23.2
p-SO <sub>2</sub> Ph	22.1 <sup>50</sup>
m-SO <sub>2</sub> Ph	23.0 <sup>50</sup>
p-C≡N	22.0 <sup>50</sup>
p-CF <sub>3</sub>	22.7 <sup>50</sup>
m-CF <sub>3</sub>	22.8 <sup>50</sup>

## Ketones

	18.7 <sup>58</sup>
	19.4 <sup>58</sup>
	18.8 <sup>58</sup>
	n
	3 28.2
	4 24.9
	5 25.8
	6 26.7 <sup>58</sup>
	7 27.7
	8 27.4

	n
	4 26.2
	5 25.8 <sup>51</sup>
	6 26.4 <sup>51</sup>
	7 27.8
	8 27.4
	10 26.7
	12 26.9

	24.8 <sup>59</sup>
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	25.8
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	16.9 <sup>51</sup>
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	24.7
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	29.0
--	------

	28.1
--	------

	25.5
--	------

	32.4
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	10.1 <sup>53</sup>
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## Ketones

	27.1 <sup>1</sup>
	27.7 <sup>58</sup>
	26.3 <sup>58</sup>
	28.2 <sup>58</sup>

## β-Diketones

X = H	13.3 <sup>42</sup>
Me	15.1 <sup>42</sup>
Et	15.3 <sup>43</sup>
Ac	8.6 <sup>43</sup>

	13.4 <sup>42</sup>
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	14.2 <sup>58</sup>
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X = H	11.2 <sup>42</sup>
Me	11.3 <sup>43</sup>
Ac	9.8 <sup>43</sup>

	10.3 <sup>59</sup>
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	18.2 <sup>42</sup>
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	14.2 <sup>52</sup>
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## Lactones

	13.5 <sup>51</sup>
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	10.7 <sup>51</sup>
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	25.2 <sup>59</sup>
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	23.3 <sup>59</sup>
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	24.5 <sup>59</sup>
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## Esters

X = H	29.5 <sup>44</sup>
<sup>+</sup> NMe <sub>3</sub>	20.0 <sup>44</sup>
<sup>+</sup> Py	14.1 <sup>44</sup>
Ph	22.7 <sup>18</sup>
CN	13.1 <sup>18</sup>
(MeO) SPh	21.4 <sup>52</sup>
SO <sub>2</sub> CF <sub>3</sub>	6.4 <sup>61</sup>
NO <sub>2</sub>	9.1 <sup>61</sup>

	30.3
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	23.6 <sup>18</sup>
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	16.9 <sup>51</sup>
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	18.7 <sup>51</sup>
--	--------------------

	16.9 <sup>51</sup>
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	19.5 <sup>38</sup>
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	14.2 <sup>58</sup>
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	20.9
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	11.5 <sup>59</sup>
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## Malonate Esters

X = H	16.4 <sup>42</sup>
<sup>+</sup> NMe <sub>3</sub>	11.8 <sup>44</sup>
<sup>+</sup> Py	5.6 <sup>44</sup>

X = H	15.9 <sup>43</sup>
Me	18.0 <sup>43</sup>
Et	18.5 <sup>43</sup>
CO <sub>2</sub> Me	10.8 <sup>43</sup>
CF <sub>3</sub>	10.8

X = H	7.3 <sup>43</sup>
Me	7.4 <sup>43</sup>
Et	7.6 <sup>43</sup>

## Equilibrium pKa Table (DMSO Solvent and Reference)

## Amides (C-H)

	(35)
	24.9 <sup>44</sup>
	26.6 <sup>18</sup>
	25.9 <sup>18</sup>
	24.9 <sup>18</sup>
	18.2 <sup>51</sup>
	17.2 <sup>18</sup>
	25.7 <sup>51</sup>
	21.3 <sup>51</sup>
	18.5 <sup>51</sup>
	10.0 <sup>51</sup>
	13.5 <sup>51</sup>

## Amides (NH)

R = H	23.5 <sup>13</sup>
Me	25.5 <sup>13</sup>
CH <sub>2</sub> OPh	23.0 <sup>27</sup>
CH <sub>2</sub> OMe	23.9 <sup>27</sup>
CH <sub>2</sub> SPh	23.0 <sup>27</sup>
CH <sub>2</sub> F	22.3 <sup>27</sup>
CH <sub>2</sub> NH <sub>2</sub>	24.7
CH <sub>2</sub> NMe <sub>3</sub> <sup>+</sup>	15.3 <sup>27</sup>
Ph	23.3 <sup>41</sup>
3-Py	22.0 <sup>27</sup>
4-Py	21.6 <sup>27</sup>
2-Fu	22.5
CF <sub>3</sub>	17.2 <sup>52</sup>
OEt	24.2 <sup>51</sup>
NH <sub>2</sub>	26.9
R = Me	21.5 <sup>41</sup>
Ph	18.8 <sup>41</sup>
CH <sub>2</sub> F	18.2
CH <sub>2</sub> OMe	19.4
CH <sub>2</sub> SPh	19.0
CF <sub>3</sub>	12.6
N≡C-NH <sub>2</sub>	17.0 <sup>57</sup>
	25.9 <sup>57</sup>
	18.5 <sup>41</sup>
	X = O 23.3 X = S 16.9 <sup>41</sup>
	16.9 <sup>41</sup>
	X = O 24.2 <sup>51</sup> X = S 13.3
	18.5 <sup>51</sup> 10.0 <sup>51</sup>
	14.7
	15.0 <sup>48</sup>

## Amides (NH)

	20.7 <sup>51</sup>
	26.6 <sup>51</sup>
	25.4
	X = O 17.0 X = S 13.3
	X = O 14.8 X = S 11.9
	X = H 14.1 X = F 12.7

## Carbamates (NH)

	24.2 <sup>51</sup>
	20.8 <sup>51</sup>

## Nitro

O <sub>2</sub> N-CH <sub>2</sub> -X	
X = H	17.2 <sup>1</sup>
Me	16.7 <sup>1</sup>
Et	17.0
Ph	12.2 <sup>9</sup>
SPh	11.8 <sup>10</sup>
SO <sub>2</sub> Ph	7.1 <sup>6</sup>
COPh	7.7 <sup>6</sup>
CH=CH <sub>2</sub>	11.3

	16.9 <sup>2</sup>
	n = 3 26.9 <sup>12</sup> 4 17.8 <sup>12</sup> 5 16.0 <sup>12</sup> 6 17.9 <sup>12</sup> 7 15.8 <sup>12</sup>

## Acetylenes

Ph-C≡C-H	28.8 <sup>1,23</sup>
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## Nitriles

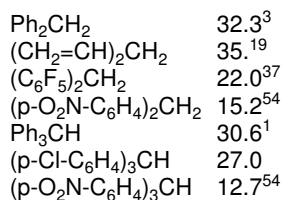
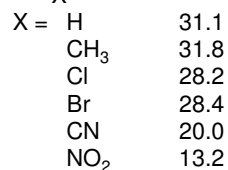
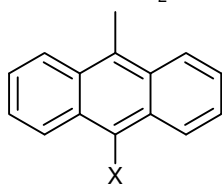
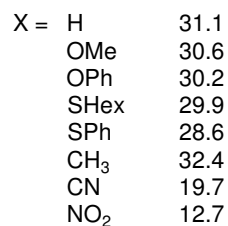
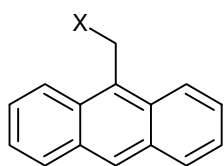
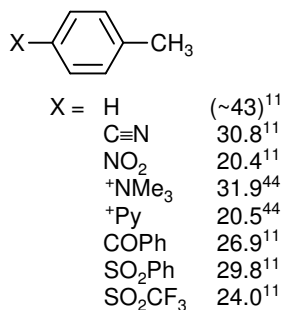
X = H	31.3 <sup>1</sup>
Me	32.5 <sup>5</sup>
Ph	21.9 <sup>9</sup>
C <sub>6</sub> F <sub>5</sub>	15.8 <sup>37</sup>
2-Furyl	21.4
1-Naphthyl	20.9 <sup>60</sup>
2-Naphthyl	20.7 <sup>60</sup>
9-Anthryl	19.8 <sup>60</sup>
COPh	10.2 <sup>6</sup>
	17.2 <sup>18</sup>
CO <sub>2</sub> Et	13.1 <sup>18</sup>
C≡N	11.1 <sup>1</sup>
OPh	28.1 <sup>5</sup>
+NMe <sub>3</sub>	20.6 <sup>6</sup>
+Py	16.5 <sup>44</sup>
SPh	20.8 <sup>5</sup>
SMe	24.3 <sup>36</sup>
SO <sub>2</sub> Ph	12.0 <sup>6</sup>
X = H	21.9 <sup>9,60</sup>
p-Me	22.9 <sup>60</sup>
Me <sub>3</sub>	24.6
p-Ph	20.8 <sup>60</sup>
p-Bz	16.0 <sup>60</sup>
p-NMe <sub>2</sub>	24.6 <sup>60</sup>
p-OMe	23.8 <sup>60</sup>
m-OMe	21.6 <sup>60</sup>
p-F	22.2 <sup>37,60</sup>
m-F	20.0 <sup>37,60</sup>
o-F	20.4 <sup>37</sup>
p-Cl	20.6 <sup>60</sup>
m-Cl	29.5 <sup>60</sup>
m-Br	19.4 <sup>60</sup>
p-CN	16.0 <sup>60</sup>
m-CN	28.7 <sup>60</sup>
p-NO <sub>2</sub>	12.3 <sup>60</sup>
m-NO <sub>2</sub>	18.1 <sup>60</sup>
m-CF <sub>3</sub>	19.2 <sup>60</sup>
p-SPh	19.6 <sup>60</sup>
m-SPh	10.4 <sup>60</sup>
p-SO <sub>2</sub> Ph	15.8 <sup>60</sup>
m-SO <sub>2</sub> Ph	18.5 <sup>60</sup>
(NC) <sub>2</sub> CHCH <sub>3</sub>	12.4 <sup>13</sup>
N≡CCHPh <sub>2</sub>	17.5 <sup>9,60</sup>
N≡CCH(C <sub>6</sub> F <sub>5</sub> ) <sub>2</sub>	8.0 <sup>37</sup>
N≡C-FI	8.3 <sup>1</sup>
PhCH(Me)CN	23.0 <sup>60</sup>

## Malononitriles

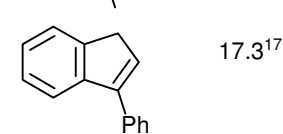
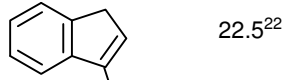
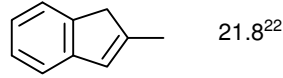
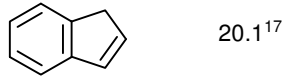
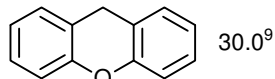
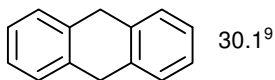
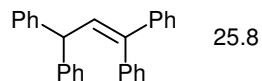
R = H	11.1 <sup>1</sup>
Me	12.4 <sup>13</sup>
Ph	4.2
pClC <sub>6</sub> H <sub>4</sub>	3.1
pMeOC <sub>6</sub> H <sub>4</sub>	5.6
tBu	13.2
NH <sub>2</sub>	13.7 <sup>34</sup>
NMe <sub>2</sub>	

## Equilibrium pKa Table (DMSO Solvent and Reference)

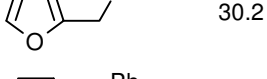
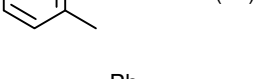
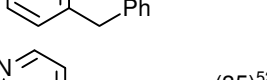
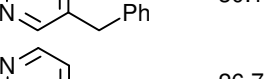
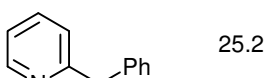
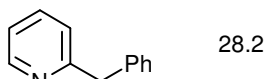
## Hydrocarbons



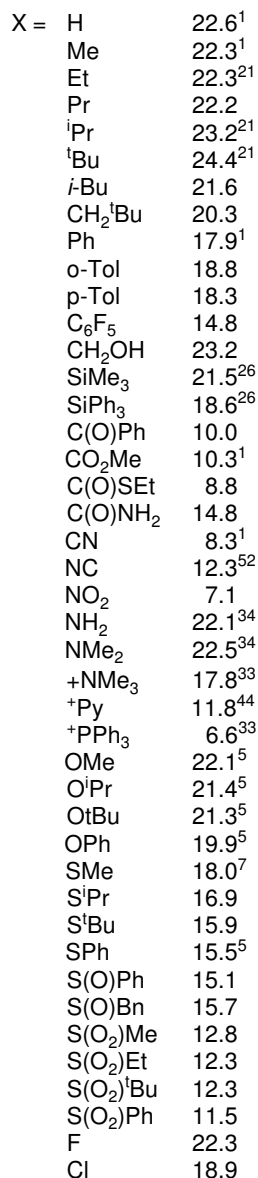
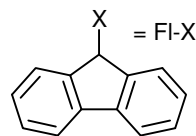
## Hydrocarbons



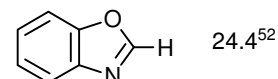
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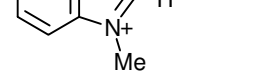
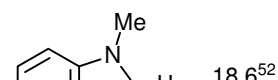
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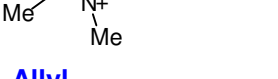
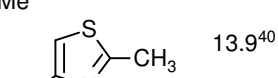
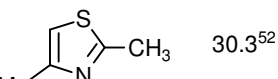
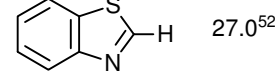
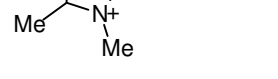
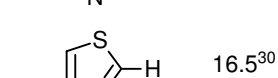
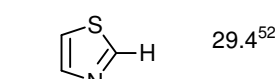
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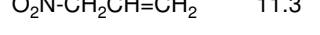
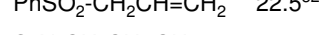
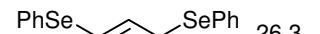
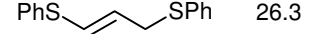
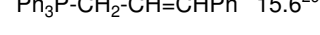
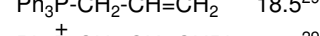
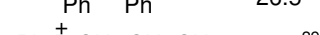
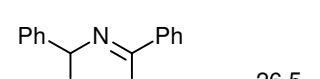
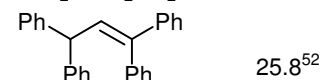
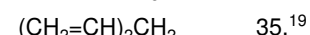
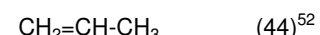
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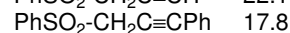
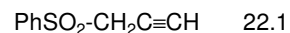
## Thiazole



## Allyl



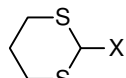
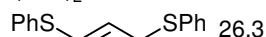
## Propargyl



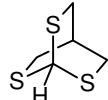
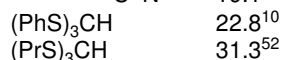
## Equilibrium pKa Table (DMSO Solvent and Reference)

## Sulfides

MeS-CH <sub>3</sub>	(45) <sup>52</sup>
PhS-CH <sub>2</sub> -X	
X = H	(42) <sup>52</sup>
Ph	30.8 <sup>10</sup>
C≡N	20.8 <sup>5</sup>
COMe	18.7 <sup>10</sup>
COPh	17.1 <sup>35</sup>
NO <sub>2</sub>	11.8 <sup>10</sup>
<sup>+</sup> NMe <sub>3</sub>	28.0 <sup>44</sup>
<sup>+</sup> Py	17.7 <sup>44</sup>
SPh	30.8 <sup>3</sup>
SO <sub>2</sub> Ph	20.5 <sup>5</sup>
SO <sub>2</sub> CF <sub>3</sub>	11.0 <sup>10</sup>
POPh <sub>2</sub>	24.9
MeS-CH <sub>2</sub> -SO <sub>2</sub> Ph	23.4 <sup>5</sup>
MeS-FI	18.0 <sup>7</sup>
PhS-FI	15.5 <sup>5</sup>
MeS-CH <sub>2</sub> -CN	24.3 <sup>21</sup>
<i>t</i> -BuS-CH <sub>2</sub> -CN	22.9 <sup>21</sup>
PhSCHPh <sub>2</sub>	26.7 <sup>10</sup>
(PhS) <sub>2</sub> CHPh	23.0 <sup>10</sup>

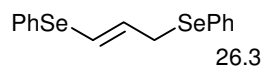


X = H	(39) <sup>23</sup>
Ph	30.7 <sup>10</sup>
PhPh	29.0 <sup>23</sup>
CO <sub>2</sub> Me	20.8 <sup>23</sup>
C≡N	19.1 <sup>23</sup>

30.5<sup>10</sup>

## Selenides

PhSe-CH <sub>2</sub> -SePh	18.6 <sup>5</sup>
PhSeCHPh <sub>2</sub>	27.5
(PhSe) <sub>2</sub> CH <sub>2</sub>	31.3
PhSeCH <sub>2</sub> Ph	31.0
(PhSe) <sub>2</sub> CHPh	16.2 <sup>52</sup>



## Sulfoxides

Ph-S(=O)-CH <sub>2</sub> -X	
X = H	33.1 <sup>5</sup>
Ph	27.2
SOPh	18.2
Me-S(=O)-CH <sub>2</sub> -X	
X = H	35.1 <sup>1</sup>
SMe	29.0
Ph	29.0 <sup>1</sup>
Ph-S(=O)-CHPh <sub>2</sub>	24.6

## Sulfimides

Ph-S(=N-Ts)-Me	27.6
Ph-S(=N-SO <sub>2</sub> Ph)-Me	30.7

## Sulfonium Salts

Me <sub>3</sub> S <sup>+</sup> =O	18.2
Ph-S <sup>+</sup> (Me)-CH <sub>2</sub> -Ph	16.3
Me-S <sup>+</sup> (Me)-CH <sub>2</sub> -Ph	17.8 <sup>32</sup>
FI-S <sup>+</sup> Me <sub>2</sub>	6.5 <sup>32</sup>

## Sulfoximides (C-H)

Ph-S(=O)-NMe	33.0 <sup>15</sup>
Ph-S(=O)-NTs	
X = H	24.5 <sup>15</sup>
Cl	20.7
Ph-S(=O)-CH <sub>2</sub> -X	
X = H	24.5 <sup>15</sup>
Cl	20.7
Ph-S(=O)-CH(SiMe <sub>3</sub> ) <sub>2</sub>	19.1 <sup>26</sup>
Ph-S(=O)-NSO <sub>2</sub> Ph	28.5
Ph-S(=O)-NSO <sub>2</sub> Ph	28.7
Ph-S(=O)-N <sup>+</sup> Me <sub>2</sub>	14.4 <sup>15</sup>

## Sulfonates

Me-S(=O) <sub>2</sub> -OPh	25.2
PhCH <sub>2</sub> -S(=O) <sub>2</sub> -OPh	19.9 <sup>53</sup>
PhCH <sub>2</sub> -S(=O) <sub>2</sub> -SPh	19.1
PhCH <sub>2</sub> -S(=O) <sub>2</sub> -F	16.9

## Sulfonamides (C-H)

Ph-N(S(=O) <sub>2</sub> )-CH <sub>2</sub> Ph	24.1 <sup>53</sup>
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## Sulfones

Ph-S(=O) <sub>2</sub> -X	
X = H	29.0 <sup>1</sup>
Me	31.0 <sup>5</sup>
<i>t</i> -Bu	31.2 <sup>5</sup>
Ph	23.4 <sup>1</sup>
α-Naphth	22.5
β-Naphth	22.3 <sup>1</sup>
2-Py	20.5
3-Py	21.6
4-Py	18.6
CH=CH <sub>2</sub>	22.5
CH=CHPh	20.2 <sup>51</sup>
C≡CH	22.1
C≡CPh	17.8
COMe	12.5 <sup>5</sup>
COPh	11.4 <sup>5</sup>
C≡N	12.0 <sup>5</sup>
OPh	27.9 <sup>5</sup>
OMe	30.7 <sup>5</sup>
<sup>+</sup> NMe <sub>3</sub>	19.4 <sup>5</sup>
NO <sub>2</sub>	7.1 <sup>5</sup>
SMe	23.4 <sup>5</sup>
SPh	20.5 <sup>5</sup>
SO <sub>2</sub> Ph	12.2 <sup>6</sup>
PPh <sub>2</sub>	20.2 <sup>3</sup>
SiMe <sub>3</sub>	26.1 <sup>26</sup>
SiPh <sub>3</sub>	21.3 <sup>26</sup>
F	28.5 <sup>52</sup>
Cl	23.8 <sup>52</sup>

Ph-SO <sub>2</sub> - <i>i</i> -Pr	32.1
Ph-S(=O) <sub>2</sub> -Cyclopropyl	31.8
Me-S(=O) <sub>2</sub> -Me	31.1 <sup>52</sup>
Et-S(=O) <sub>2</sub> -Et	32.8 <sup>9</sup>

## Sulfones

X-S(=O) <sub>2</sub> -CH <sub>2</sub> Ph	
X = Me	25.4 <sup>55</sup>
<i>t</i> -Bu	24.9 <sup>21</sup>
NMePh	24.1 <sup>53</sup>
CH <sub>2</sub> Ph	23.9 <sup>52</sup>
CF <sub>3</sub>	14.6 <sup>52</sup>

CF <sub>3</sub> -SO <sub>2</sub> -CH <sub>3</sub>	18.8 <sup>2</sup>
CF <sub>3</sub> -SO <sub>2</sub> -Et	20.4
CF <sub>3</sub> -SO <sub>2</sub> - <i>i</i> -Pr	21.8 <sup>2</sup>

CF <sub>3</sub> -S(=O)-Cyclopropyl	26.6 <sup>2</sup>
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(CF <sub>3</sub> -SO <sub>2</sub> ) <sub>2</sub> CH <sub>2</sub>	2.1 <sup>52</sup>
Ph-SO <sub>2</sub> -CHPh <sub>2</sub>	22.3 <sup>9</sup>
(PhSO <sub>2</sub> ) <sub>2</sub> CHMe	14.3 <sup>10</sup>
PhSO <sub>2</sub> CH(SiMe <sub>3</sub> ) <sub>2</sub>	20.4 <sup>26</sup>

PhSO <sub>2</sub> -CH <sub>2</sub> CH=CH <sub>2</sub>	22.5 <sup>52</sup>
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Ph-S(=O)-CH=CH-Ph	20.2 <sup>51</sup>
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PhSO <sub>2</sub> -CH <sub>2</sub> C≡CH	22.1
PhSO <sub>2</sub> -CH <sub>2</sub> C≡CPh	17.8

PhSO <sub>2</sub> -C <sub>6</sub> H <sub>4</sub> -CH <sub>3</sub>	29.8
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CF <sub>3</sub> SO <sub>2</sub> -C <sub>6</sub> H <sub>4</sub> -CH <sub>3</sub>	24.1
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Ph-S(=O) <sub>2</sub> -Cyclohexyl	11.8 <sup>51</sup>
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(MeSO <sub>2</sub> ) <sub>2</sub> CH <sub>2</sub>	15.0 <sup>21</sup>
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Ph-S(=O) <sub>2</sub> -Cyclopentyl	10.1 <sup>53</sup>
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## Equilibrium pKa Table (DMSO Solvent and Reference)

## Halides

Ph-SO <sub>2</sub> -CH <sub>2</sub> -X	
X = H	29.0 <sup>1</sup>
F	28.5 <sup>52</sup>
Cl	23.8
	20.7
	16.9
	26.2
	20.2 <sup>52</sup>

## Silanes (C-H)

X = H	29.0 <sup>1</sup>
SiMe <sub>3</sub>	26.1 <sup>26</sup>
SiPh <sub>3</sub>	21.3 <sup>26</sup>
	28.7 <sup>52</sup>
PhSO <sub>2</sub> CH(SiMe <sub>3</sub> ) <sub>2</sub>	20.4 <sup>26</sup>
	19.1 <sup>26</sup>
X = H	22.6 <sup>1</sup>
Me	22.3 <sup>1</sup>
SiMe <sub>3</sub>	21.5 <sup>26</sup>
SiEt <sub>3</sub>	21.4 <sup>26</sup>
SiPh <sub>3</sub>	18.6 <sup>26</sup>

## Germanes (Ge-H)

Ph <sub>3</sub> Ge-H	23.1 <sup>63</sup>
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## Ethers

PhO-CH <sub>3</sub>	(49) <sup>52</sup>
MeO-CH <sub>2</sub> COPh	22.9 <sup>5</sup>
PhO-CH <sub>2</sub> COPh	21.1 <sup>5</sup>
MeO-CH <sub>2</sub> SO <sub>2</sub> Ph	30.7 <sup>5</sup>
PhO-CH <sub>2</sub> SO <sub>2</sub> Ph	27.9 <sup>5</sup>
PhO-CH <sub>2</sub> C≡N	28.1 <sup>5</sup>
X = H	22.6 <sup>21</sup>
Ph	17.9 <sup>52</sup>
MeO	22.1 <sup>5</sup>
iPrO	21.4 <sup>5</sup>
tBuO	21.3 <sup>5</sup>
PhO	19.9 <sup>5</sup>

X = H	31.1
OMe	30.6
OPh	30.2

## Phosphines

Ph <sub>2</sub> P-CH <sub>2</sub> -PPh <sub>2</sub>	29.9 <sup>3</sup>
Ph <sub>2</sub> P-CH <sub>2</sub> -SO <sub>2</sub> Ph	20.2 <sup>3</sup>

## Phosphonium (As) Salts

Ph <sub>3</sub> P <sup>+</sup> -CH <sub>2</sub> -X	
X = H	22.4 <sup>33</sup>
Ph	17.4 <sup>33</sup>
p-C <sub>6</sub> H <sub>4</sub> -CN	13.0 <sup>29</sup>
p-C <sub>6</sub> H <sub>4</sub> -NO <sub>2</sub>	11.0 <sup>29</sup>
p-C <sub>6</sub> H <sub>4</sub> -OEt	18.8 <sup>29</sup>
SPh	14.9 <sup>33</sup>
CO <sub>2</sub> Et	8.5 <sup>33</sup>
COMe	7.1 <sup>33</sup>
CHO	6.1 <sup>33</sup>
CN	6.9 <sup>33</sup>
COPh	6.0 <sup>33</sup>
Ph <sub>3</sub> P <sup>+</sup> -CHMeCO <sub>2</sub> Et	9.3 <sup>33</sup>
Ph <sub>3</sub> P <sup>+</sup> -Pr- <i>i</i>	21.2
Ph <sub>3</sub> P <sup>+</sup> -CH <sub>2</sub> -C <sub>6</sub> H <sub>4</sub> CN	13.0 <sup>29</sup>
Ph <sub>3</sub> As <sup>+</sup> -CH <sub>2</sub> -C <sub>6</sub> H <sub>4</sub> CN	17.0 <sup>29</sup>
Ph <sub>3</sub> P <sup>+</sup> -CH <sub>2</sub> -CH=CH <sub>2</sub>	18.5 <sup>29</sup>
Ph <sub>3</sub> P <sup>+</sup> -CH <sub>2</sub> -CH=CHPh	15.6 <sup>29</sup>
Ph <sub>3</sub> P <sup>+</sup> -FI	6.6 <sup>33</sup>

## Phosphonates

X = Ph	27.6
C≡N	16.4
CO <sub>2</sub> Et	18.6
Cl	26.2
SiMe <sub>3</sub>	28.7 <sup>52</sup>
X = Cl	26.2
R = H	23.2
Me	24.9
Ph	18.3

## Phosphine Oxides

X = SPh	24.9
C≡N	16.9
	16.3
	19.3

## Equilibrium pKa Table (DMSO Solvent and Reference)

## Amines (CH)

	20.3 <sup>52</sup>
X = H	22.6 <sup>52</sup>
NMe <sub>2</sub>	22.5 <sup>36</sup>
NEt <sub>2</sub>	21.4 <sup>36</sup>
NiPr <sub>2</sub>	22.5 <sup>36</sup>

	18.2 <sup>36</sup>
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## Amines (NH)

NH <sub>3</sub>	(41) <sup>19</sup>
	(44) <sup>19</sup>
X = H	30.6 <sup>11,54</sup>
m-CH <sub>3</sub>	31.0 <sup>11,54</sup>
p-Ac	25.3 <sup>54</sup>
p-Bz	24.4 <sup>54</sup>
p-F	30.7 <sup>54</sup>
o-F	28.7 <sup>54</sup>
o-Cl	27.6 <sup>54</sup>
m-Cl	28.5 <sup>54</sup>
p-Cl	29.4 <sup>54</sup>
m-Br	28.4 <sup>54</sup>
p-Br	29.1 <sup>54</sup>
m-OMe	30.5 <sup>54</sup>
p-C≡N	25.3 <sup>11</sup>
m-C≡N	27.5 <sup>11</sup>
p-PhCO	24.4 <sup>11</sup>
p-PhS	28.2 <sup>54</sup>
p-PhSO <sub>2</sub>	24.9 <sup>11,54</sup>
p-MeSO <sub>2</sub>	25.6 <sup>54</sup>
p-CF <sub>3</sub> SO <sub>2</sub>	21.8 <sup>54</sup>
p-CF <sub>3</sub>	27.0 <sup>54</sup>
m-CF <sub>3</sub>	28.2 <sup>54</sup>
p-NO <sub>2</sub>	20.9 <sup>11,54</sup>

	27.7 <sup>54</sup>
	28.5
	26.5 <sup>54</sup>
N≡C-NH <sub>2</sub>	17.0 <sup>19</sup>
Ph <sub>2</sub> NH	25.0 <sup>16</sup>

## Ammonium Salts (NH)

NH <sub>4</sub> <sup>+</sup>	10.5 <sup>52</sup>
BuNH <sub>3</sub> <sup>+</sup>	11.1 <sup>64</sup>
PhNH <sub>3</sub> <sup>+</sup>	3.8 <sup>64</sup>
R = H	2.4
OMe	3.6
Me	3.0

Et <sub>3</sub> N <sup>+</sup> -H	9.0 <sup>47,64</sup>
BnNH <sub>3</sub> <sup>+</sup>	10.2 <sup>64</sup>
BnMe <sub>2</sub> N <sup>+</sup> -H	7.6 <sup>47</sup>
Bn <sub>3</sub> N <sup>+</sup> -H	3.7 <sup>46</sup>
	11.1 <sup>64</sup>

	9.8 <sup>45</sup>
	8.9 <sup>45,64</sup>

	10.9 <sup>64</sup>
	9.2 <sup>64</sup>

	7.5 <sup>45</sup>
	3.4 <sup>52</sup>
	4.1

## Imides (NH)

R = H	13.1 <sup>48</sup>
R = Ph	9.9 <sup>48</sup>
R = H	11.0 <sup>48</sup>
R = H	15.1 <sup>48</sup>
R = Me	15.0 <sup>48</sup>

	14.7
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## Ammonium Salts (CH)

Me <sub>3</sub> N <sup>+</sup> -CH <sub>2</sub> -X	
X = H	(42) <sup>33,44</sup>
SO <sub>2</sub> Ph	19.4 <sup>5</sup>
C≡N	20.6 <sup>5</sup>
COMe	16.3 <sup>33</sup>
COPh	14.6 <sup>5</sup>
CO <sub>2</sub> Et	20.0 <sup>33</sup>
CONEt <sub>2</sub>	24.9 <sup>18</sup>
CONEt <sub>2</sub>	15.3 <sup>27</sup>
CONEt <sub>2</sub>	31.9 <sup>33</sup>
SPh	28.0 <sup>33</sup>
1-Py <sup>+</sup> -CH <sub>2</sub> -X	
X = C≡N	16.5 <sup>44</sup>
COMe	11.8 <sup>44</sup>
COPh	10.7 <sup>44</sup>
CO <sub>2</sub> Et	14.1 <sup>44</sup>
CONEt <sub>2</sub>	24.9 <sup>18</sup>
Ph	20.5 <sup>44</sup>
SPh	17.7 <sup>44</sup>

Me <sub>3</sub> N <sup>+</sup> -FI	17.8 <sup>33</sup>
Py <sup>+</sup> -FI	11.8 <sup>44</sup>

## Isocyanide

PhCH <sub>2</sub> N=C	27.4 <sup>52</sup>
	12.3 <sup>52</sup>

## Imines (CH)

	14.4
	26.5
	24.3 <sup>52</sup>
	22.1

## Imines (NH)

	31.0 <sup>41</sup>
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## Pyrrole, Indole (N-H)

	23.0 <sup>19</sup>
	21.0 <sup>19</sup>
	19.9 <sup>19</sup>

## Azoles (NH)

	18.6 <sup>52</sup>
	19.8 <sup>52</sup>
	14.8 <sup>52</sup>
	13.9 <sup>52</sup>
	8.2 <sup>52</sup>
	16.4 <sup>52</sup>
	15.3

## Oximes (OH)

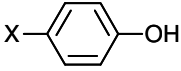
	20.2 <sup>31</sup>
	17.0 <sup>31</sup>
	28.5 <sup>31</sup>
	25.2 <sup>31</sup>
	20.1 <sup>31</sup>
	14.9 <sup>31</sup>

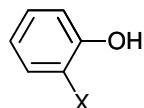
## Equilibrium pKa Table (DMSO Solvent and Reference)

## Alcohols (OH)

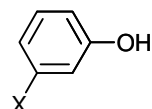
HOH	31.4 <sup>24</sup>
MeOH	29.0 <sup>24</sup>
EtOH	29.8 <sup>24</sup>
<i>i</i> -PrOH	30.3 <sup>24</sup>
<i>t</i> -BuOH	32.2 <sup>24</sup>
CF <sub>3</sub> CH <sub>2</sub> OH	23.5 <sup>52</sup>
(CF <sub>3</sub> ) <sub>2</sub> CHOH	17.9
(CF <sub>3</sub> ) <sub>3</sub> COH	10.7 <sup>52</sup>

## Phenols (OH)

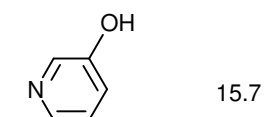
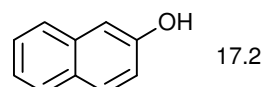
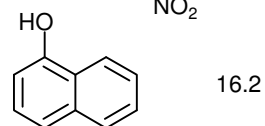
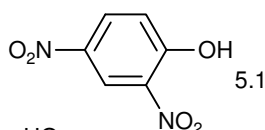
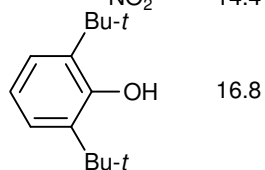
	
X = H	18.0 <sup>25</sup>
Me	18.9 <sup>25</sup>
OMe	19.1
OAc	14.1
NMe <sub>2</sub>	19.8
NO <sub>2</sub>	10.8
CF <sub>3</sub>	15.3
Cl	16.7 <sup>25</sup>
F	18.0
NMe <sub>3</sub> <sup>+</sup>	14.7
SO <sub>2</sub> Me	13.6
CN	13.2



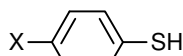
F	15.6
OMe	17.8
Ac	14.8
CN	12.1
NH <sub>2</sub>	18.2



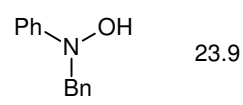
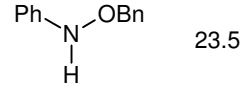
X = Cl	15.8 <sup>25</sup>
F	15.8 <sup>25</sup>
CN	14.8 <sup>25</sup>
NO <sub>2</sub>	14.4 <sup>25</sup>



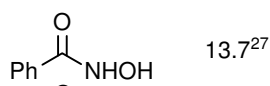
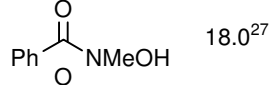

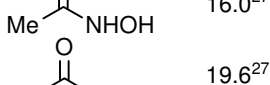
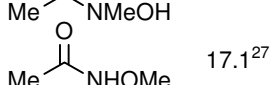
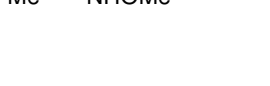
## Thiols (SH)

	
X = H	10.3 <sup>20</sup>
OMe	11.2 <sup>20</sup>
Br	9.0 <sup>20</sup>
NO <sub>2</sub>	5.5 <sup>20</sup>
<i>t</i> -BuSH	17.9
<i>n</i> -BuSH	17.0
MeO <sub>2</sub> CCH <sub>2</sub> -SH	12.9
PhCH <sub>2</sub> -SH	15.3
PhC(O)-SH	5.2 <sup>62</sup>
Ph-SeH	7.1 <sup>62</sup>

## Hydroxylamine (NH, OH)

	23.9
	23.5
PhNHOH	24.2

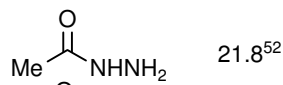
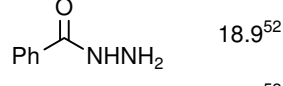
## Hydroxamic Acid (NH, OH)

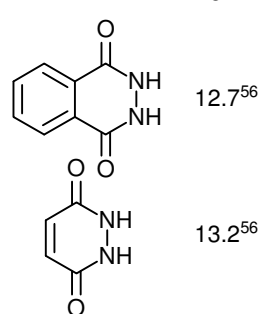
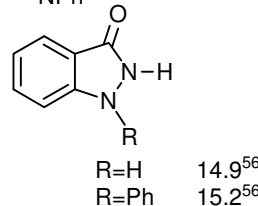
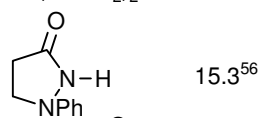
	13.7 <sup>27</sup>
	18.0 <sup>27</sup>
	14.4 <sup>27</sup>
	16.0 <sup>27</sup>
	19.6 <sup>27</sup>
	17.1 <sup>27</sup>

## Inorganic Acids

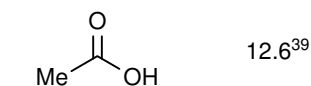
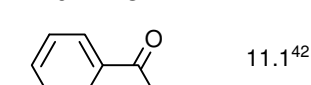
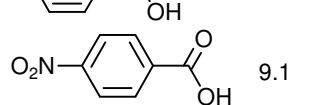
HCN	12.9 <sup>52</sup>
HN <sub>3</sub>	7.9 <sup>52</sup>
HF	15. <sup>52</sup>
HCl	1.8 <sup>52</sup>
HBr	0.9 <sup>52</sup>
NH <sub>4</sub> <sup>+</sup>	10.5 <sup>52</sup>
HOH	31.4 <sup>24</sup>
HON=O	7.5 <sup>52</sup>
NH <sub>3</sub>	(41) <sup>19</sup>
H <sub>2</sub> N-CN	16.9 <sup>52</sup>

## Hydrazide (NH)

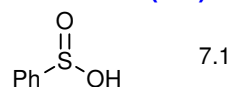
	21.8 <sup>52</sup>
	18.9 <sup>52</sup>
PhSO <sub>2</sub> -NHNH <sub>2</sub>	17.1 <sup>52</sup>
PhSO <sub>2</sub> -NHNMe <sub>2</sub>	15.8 <sup>52</sup>
Me(C=O)-NHNH <sub>2</sub>	21.8 <sup>27</sup>
Ac-NHNH-Ac	16.7 <sup>56</sup>
Ph(C=O)-NHNMe <sub>2</sub>	19.7
Ph(C=O)-NHNH <sub>2</sub>	18.9 <sup>27</sup>
Ph(C=O)-NHNMe <sub>2</sub>	19.7 <sup>27</sup>
3-Py(C=O)-NHNH <sub>2</sub>	17.5 <sup>27</sup>
EtO <sub>2</sub> C-NHNH <sub>2</sub>	22.2 <sup>56</sup>
O=C(NHNH <sub>2</sub> ) <sub>2</sub>	23.3 <sup>57</sup>
S=C(NHNH <sub>2</sub> ) <sub>2</sub>	16.6 <sup>57</sup>



## Carboxylic Acids (OH)

	12.6 <sup>39</sup>
	11.1 <sup>42</sup>
	9.1

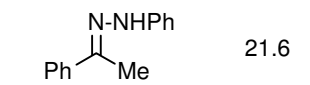
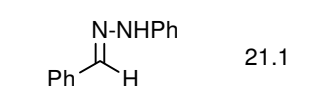
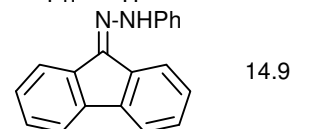
## Sulfinic Acids (OH)



## Sulfonic Acids (OH)

Me-SO <sub>2</sub> -OH	1.6 <sup>39</sup>
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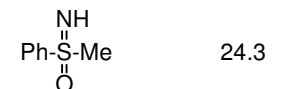
## Hydrazone (NH)

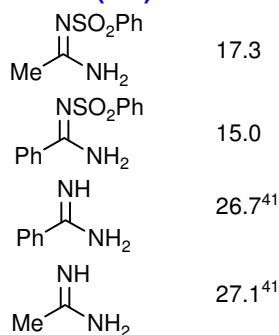
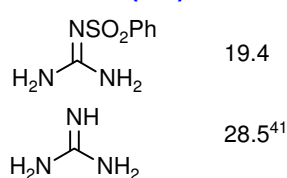
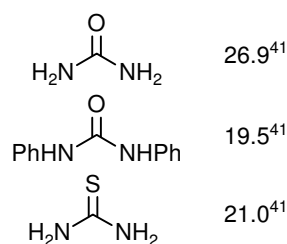
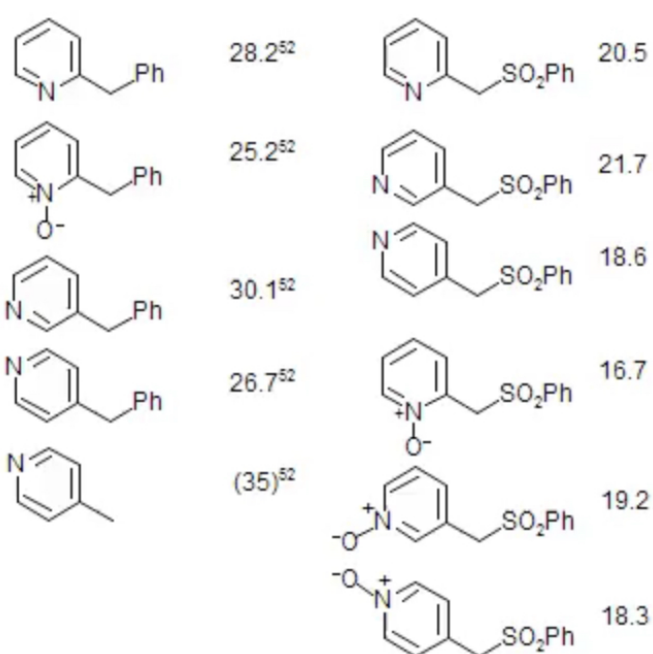
	21.6
	21.1
	14.9

## Hydrazine (NH)

Ph-NHNH-Ph	26.2 <sup>56</sup>
Ph-NHNH <sub>2</sub>	28.8 <sup>56</sup>
Ph-NHNPh <sub>2</sub>	24.5 <sup>56</sup>
2,4-(NO <sub>2</sub> ) <sub>2</sub> PhNHNPh <sub>2</sub>	12.1 <sup>56</sup>
4-CF <sub>3</sub> PhNHNH <sub>2</sub>	25.7 <sup>56</sup>
4-NC-PhNHNH <sub>2</sub>	25.1 <sup>56</sup>

## Sulfonamide (NH)

Me-SO <sub>2</sub> -NH <sub>2</sub>	17.5 <sup>39</sup>
CF <sub>3</sub> -SO <sub>2</sub> -NH <sub>2</sub>	9.7 <sup>39</sup>
Ph-SO <sub>2</sub> -NH <sub>2</sub>	16.1 <sup>27</sup>
Ph-SO <sub>2</sub> -NHOH	15.4 <sup>57</sup>
Me-SO <sub>2</sub> -NHPh	12.9
Ph-SO <sub>2</sub> -NHNH <sub>2</sub>	17.1 <sup>27</sup>
Ph-SO <sub>2</sub> -NHNMe <sub>2</sub>	15.8 <sup>57</sup>
	24.3

**Amidine (NH)****Guanidine (NH)****Ureas (NH)****Pyridyl****Equilibrium pKa Table (DMSO Solvent and Reference)****References (Bordwell et al.)**

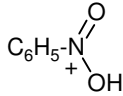
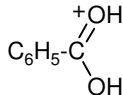
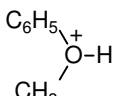
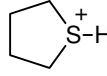
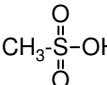

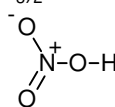
- J. Am. Chem. Soc.* **1975**, 97, 7006.
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- All others are F. G. Bordwell, private communication. For a review, see: F. G. Bordwell *Acc. Chem. Res.* **1988**, 21, 456, 463.

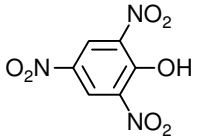


Equilibrium pKa Table (H<sub>2</sub>O Solvent and Reference)

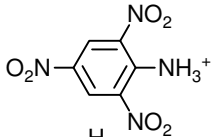
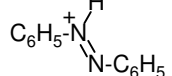
Values outside the boxes were determined by approximate methods.

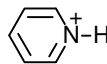
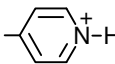
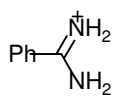
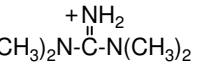
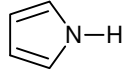
## Oxygen Acids

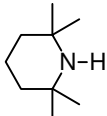
CF <sub>3</sub> SO <sub>3</sub> H	
	-12.4
	-7.8
	-6.5
(CH <sub>3</sub> ) <sub>2</sub> S <sup>+</sup> -H	-5.4
	-4.4
(CH <sub>3</sub> ) <sub>2</sub> O <sup>+</sup> -H	-3.8
	-2.6
CH <sub>3</sub> -OH <sub>2</sub> <sup>+</sup>	-2.2
	-2.1
(CH <sub>3</sub> ) <sub>2</sub> S=OH <sup>+</sup>	-1.8
	-1.4
CF <sub>3</sub> -CO <sub>2</sub> H	-0.3

	0.3
(CH <sub>3</sub> ) <sub>2</sub> Se=OH <sup>+</sup>	2.6
C <sub>6</sub> H <sub>5</sub> -CO <sub>2</sub> H	4.2
CH <sub>3</sub> CO <sub>2</sub> H	4.8
HOCO <sub>2</sub> H	6.3
C <sub>6</sub> H <sub>5</sub> -SH	6.5
CH <sub>2</sub> =C(Ph)OH	8.0 <sup>2</sup>
C <sub>6</sub> H <sub>5</sub> -OH	10.0
HCO <sub>3</sub> <sup>-</sup>	10.3
RS-H	10.5
CH <sub>2</sub> =CHOH	10.5
CH <sub>2</sub> =C(CH <sub>3</sub> )OH	10.9
HOOH	11.7
H <sub>2</sub> O	15.7
CH <sub>3</sub> -OH	16
(CH <sub>3</sub> ) <sub>3</sub> C-OH	20

## Nitrogen Acids

$\overset{+}{P}H_4$	-14.
C <sub>6</sub> H <sub>5</sub> -C≡N <sup>+</sup> -H	-10.5
CH <sub>3</sub> -C≡N <sup>+</sup> -H	-10.
	-9.3
	-2.9

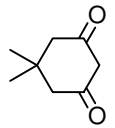
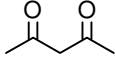
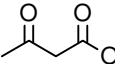
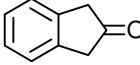
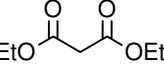

(C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub> NH <sub>2</sub> <sup>+</sup>	0.8
CH <sub>3</sub> -P <sup>+</sup> H <sub>3</sub>	2.7
C <sub>6</sub> H <sub>5</sub> -NH <sub>3</sub> <sup>+</sup>	4.6
	5.2
N≡C-CH <sub>2</sub> CH <sub>2</sub> -NH <sub>3</sub> <sup>+</sup>	7.9
(CH <sub>3</sub> CH <sub>2</sub> ) <sub>3</sub> P <sup>+</sup> -H	9.1
H <sub>2</sub> N- 	9.2
NH <sub>4</sub> <sup>+</sup>	9.2
N≡N <sup>+</sup> -H	10.0
CH <sub>3</sub> CH <sub>2</sub> NH <sub>3</sub> <sup>+</sup>	10.6
(CH <sub>3</sub> CH <sub>2</sub> ) <sub>2</sub> NH <sub>3</sub> <sup>+</sup>	11.0
(CH <sub>3</sub> CH <sub>2</sub> ) <sub>3</sub> NH <sup>+</sup>	10.8
O=N-H	11.5
	11.2 <sup>4</sup>
	13.6
	15.




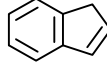

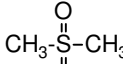
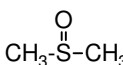

C <sub>6</sub> H <sub>5</sub> -NH <sub>2</sub>	28.
((CH <sub>3</sub> ) <sub>3</sub> Si) <sub>2</sub> N-H	30.
(i-C <sub>3</sub> H <sub>7</sub> ) <sub>2</sub> N-H	36.
	37.

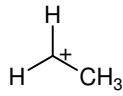
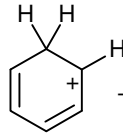
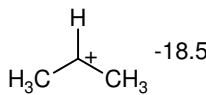
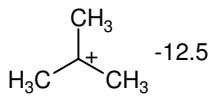
## Halogen Acids

H-I	-5.2
H-Br	-4.7
H-Cl	-2.2
H-F	3.2

## Carbon Acids

(O <sub>2</sub> N) <sub>2</sub> CH <sub>2</sub>	3.6
	5.2
	9.0 <sup>3</sup>
N≡C-H	9.1
CH <sub>3</sub> N <sup>+</sup> ≡N	10.0 <sup>1</sup>
O <sub>2</sub> N-CH <sub>3</sub>	10.2
	10.7
(CF <sub>3</sub> ) <sub>3</sub> CH	11.
(NC) <sub>2</sub> CH <sub>2</sub>	11.2
	12.2 <sup>6</sup>
	12.9
	15.

	16.7
	18.3
	19.3
	20
C <sub>6</sub> H <sub>5</sub> -CH <sub>2</sub> -C≡N	21
C <sub>6</sub> H <sub>5</sub> -C≡C-H	23
CH <sub>3</sub> CO <sub>2</sub> Et	24
H-C≡C-H	24
CH <sub>3</sub> -C≡N	25
	29
CF <sub>3</sub> -H	32
	33
(C <sub>6</sub> H <sub>5</sub> ) <sub>3</sub> C-H	32
	33
C <sub>6</sub> H <sub>5</sub> -CH <sub>3</sub>	41
	44
CH <sub>3</sub> CH <sub>3</sub>	50

	-24.8
	-24.3
	-18.5
	-12.5

## Gas Phase Acidities

