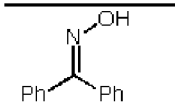
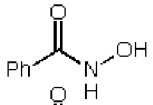
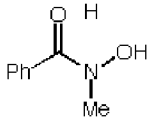
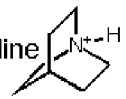
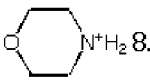
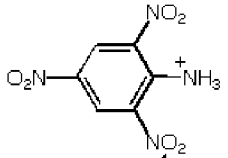
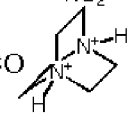
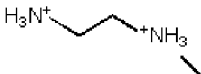
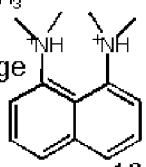
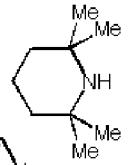
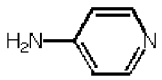
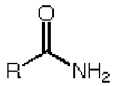
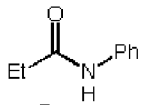
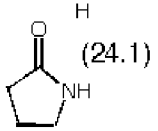
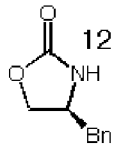
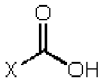
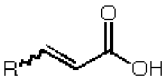
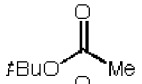
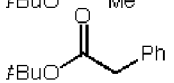
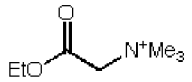
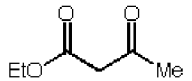
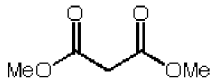
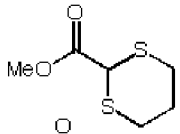
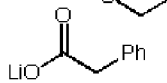
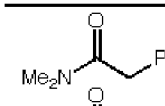
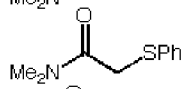
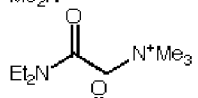
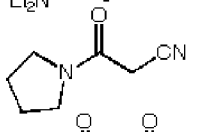
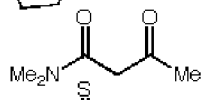
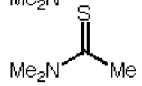
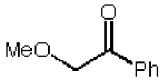
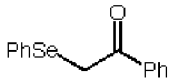
Substrate	pKa H_2O	(DMSO)
ALCOHOLS		
HOH	15.7	(27.5)
MeOH	15.54	(27.9)
i-PrOH	16.5	(29.3)
t-BuOH	17	(29.4)
c-hex$_3$COH	24	
CF_3CH_2OH	12.5	(23.5)
$(CF_3)_2CHOH$		(17.9)
C_6H_5OH	9.95	(18.0)
m-$O_2NC_6H_4OH$	8.35	
p-$O_2NC_6H_4OH$	7.14	(10.8)
p-$OMeC_6H_4OH$	10.20	(19.1)
2-napthol		(17.1)
OXIMES & HYDROXAMIC ACIDS		
	11.3	(20.1)
	8.88 (NH)	(13.7)
		(18.5)
PEROXIDES		
MeOOH	11.5	
CH_3CO_3H	8.2	

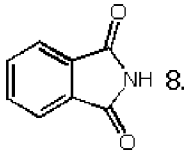
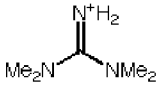
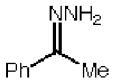
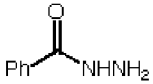
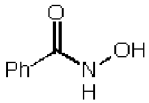
Substrate	pKa H_2O	(DMSO)
PROTONATED NITROGEN		
N^+H_4	9.2	(10.5)
EtN^+H_3	10.6	
i-$Pr_2N^+H_2$	11.05	
Et_3N^+H	10.75	(9.00)
PhN^+H_3	4.6	(3.6)
$PhN^+(Me)_2H$	5.20	(2.50)
$Ph_2N^+H_2$	0.78	
2-napthal-N^+H_3	4.16	
$H_2NN^+H_3$	8.12	
HON^+H_3	5.96	
Quinuclidine 	11.0	(9.80)
Morpholine 	8.36	
N-Me morpholine	7.38	
	-9.3	
DABCO 	2.97, 8.82 (2.97, 8.93)	
	6.90, 9.95	
Proton Sponge 	-9.0, 12.0 (--, 7.50)	
$PhCN^+H$	-10	

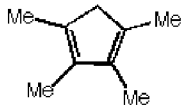
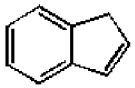
Substrate	pKa H_2O	(DMSO)
AMINES		
HN_3	4.7	(7.9)
NH_3	38	(41)
i-Pr_2NH		(36)
TMS_2NH		(30)
$PhNH_2$		(30.6)
Ph_2NH		(25.0)
$NCNH_2$		(16.9)
		(44)
TMP 		(37)
		(26.5)
AMIDES & CARBAMATES		
		
R= H		(23.5)
CH_3	15.1	(25.5)
Ph		(23.3)
CF_3		(17.2)
NH_2 (urea)		(26.9)
OEt		(24.8)
		(21.6)
		(24.1)
		12 (20.5)

Substrate	pKa H_2O	(DMSO)
CARBOXYLIC ACIDS		
		
X= CH_3	4.76	(12.3)
CH_2NO_2	1.68	
CH_2F	2.66	
CH_2Cl	2.86	
CH_2Br	2.86	
CH_2I	3.12	
$CHCl_2$	1.29	
CCl_3	0.65	
CF_3	-0.25	
H	3.77	
HO	3.6, 10.3	
C_6H_5	4.2	(11.1)
o-$O_2NC_6H_4$	2.17	
m-$O_2NC_6H_4$	2.45	
p-$O_2NC_6H_4$	3.44	
o-ClC_6H_4	2.94	
m-ClC_6H_4	3.83	
p-ClC_6H_4	3.99	
o-$(CH_3)_3N^+C_6H_4$	1.37	
p-$(CH_3)_3N^+C_6H_4$	3.43	
p-$OMeC_6H_4$	4.47	
		
R= H	4.25	
trans-CO_2H	3.02, 4.38	
cis-CO_2H	1.92, 6.23	

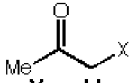
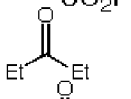
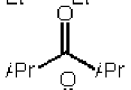
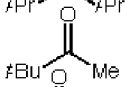
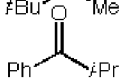
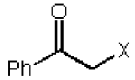
Substrate	pKa H_2O	(DMSO)
ESTERS		
	24.5	(30.3)
		(23.6)
		(20.0)
	11	(14.2)
	13	(15.7)
		(20.9)
		[30.2 (THF)]
AMIDES		
		(26.6)
		(25.9)
		(24.9)
		(17.2)
		(18.2)
		(25.7)

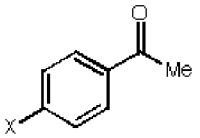
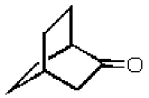
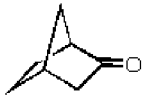
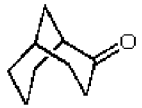
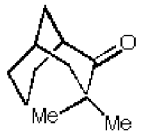
Substrate	pKa H_2O	(DMSO)
ETHERS		
CH_3OPh		(49)
$MeOCH_2SO_2Ph$		(30.7)
$PhOCH_2SO_2Ph$		(27.9)
$PhOCH_2CN$		(28.1)
		(21.1)
SELENIDES		
		(18.6)
$PhSeCHPh_2$		(27.5)
$(PhSe)_2CH_2$		(31.3)
$PhSeCH_2Ph$		(31.0)
$PhSeCH{=}CHCH_2SePh$		(27.2)
AMMONIUM		
$Me_3N^+CH_2X$		
X= CN		(20.6)
SO_2Ph		(19.4)
COPh		(14.6)
CO_2Et		(20.6)
$CONEt_2$		(24.9)

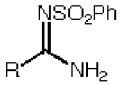
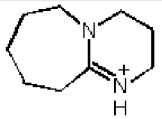
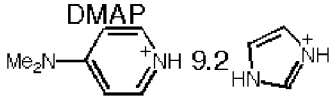
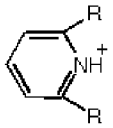
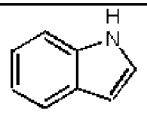
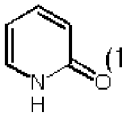
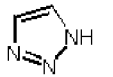
Substrate	pKa H_2O	(DMSO)
IMIDES		
	8.30	(14.7)
Ac_2NH		(17.9)
SULFONAMIDE		
$MeSO_2NH_2$		(17.5)
$PhSO_2NH_2$		(16.1)
$CF_3SO_2NH_2$	6.3	(9.7)
$MeSO_2NHPh$		(12.9)
GUANIDINIUM, HYRDAZONES,- IDES, & -INES		
		(13.6)
		(21.6)
		(18.9)
$PhSO_2NHNH_2$		(17.2)
PhNHNHPh		(26.1)
HYDROXAMIC ACID		
	8.88 (NH)	(13.7)

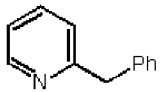
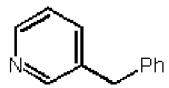
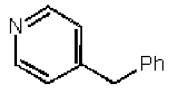
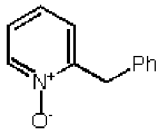
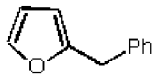
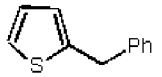
Substrate	pKa H_2O	(DMSO)
HYDROCARBONS		
$(Me)_3CH$	53	
$(Me)_2CH_2$	51	
$CH_2=CH_2$	50	
CH_4	48	(56)
	46	
$CH_2=CHCH_3$	43	(44)
PhH	43	
$PhCH_3$	41	(43)
Ph_2CH_2	33.5	(32.2)
Ph_3CH	31.5	(30.6)
HCCH	24	
PhCCH	23	(28.8)
$XC_6H_4CH_3$		
X= *p*-CN		(30.8)
p-NO_2		(20.4)
p-COPh		(26.9)
		(26.1)
	20	(20.1)
	15	(18.0)
H_2	35	

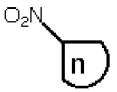
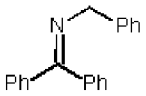
Substrate	pKa H_2O	(DMSO)
INORGANIC ACIDS		
H_2O	15.7	(32)
H_3O^+	-1.7	
H_2S	7.00	
HBr	-9.00	(0.9)
HCl	-8.0	(1.8)
HF	3.17	(15)
HOCl	7.5	
$HClO_4$	-10	
HCN	9.4	(12.9)
HN_3	4.72	(7.9)
HSCN	4.00	
H_2SO_3	1.9, 7.21	
H_2SO_4	-3.0, 1.99	
H_3PO_4	2.12, 7.21, 12.32	
HNO_3	-1.3	
HNO_2	3.29	
H_2CrO_4	-0.98, 6.50	
CH_3SO_3H	-2.6	(1.6)
CF_3SO_3H	-14	(0.3)
NH_4Cl	9.24	
$B(OH)_3$	9.23	
HOOH	11.6	

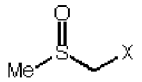
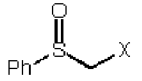
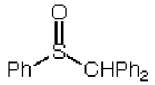
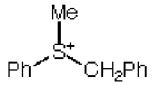
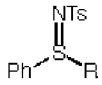
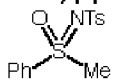
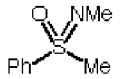
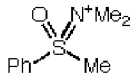
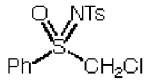
Substrate		pKa H_2O	(DMSO)
KETONES			
			
X=	H		(26.5)
	Ph		(19.8)
	SPh		(18.7)
	$COCH_3$	9	(13.3)
	SO_2Ph		(15.1)
		19-20	(27.1)
			(28.3)
			(27.7)
			(26.3)
			
X=	H		(24.7)
	CH_3		(24.4)
	Ph		(17.7)
	$COCH_3$		(12.7)
	COPh		(13.3)
	CO_2Et		(22.7)
	CN		(10.2)
	F		(21.6)
	OMe		(22.85)
	OPh		(21.1)
	SPh		(16.9)
	SePh		(18.6)
	NPh_2		(20.3)
	N^+Me_3		(14.6)
	NO_2		(7.7)
	SO_2Ph		(11.4)

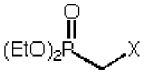
Substrate		pKa H_2O	(DMSO)
			
X=	H		(24.7)
	OMe		(25.7)
	NMe_2		(27.5)
	Br		(23.8)
	CN		(22.0)
			
n=	4		(25.1)
	5		(25.8)
	6		(26.4)
	7		(27.7)
	8		(27.4)
			(28.1)
			(29.0)
			(25.5)
			(32.4)

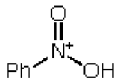
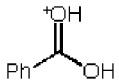
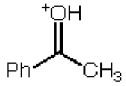
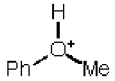
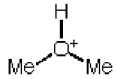
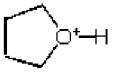
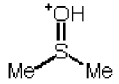
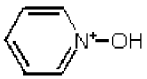
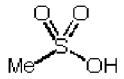
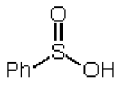
Substrate		pKa H_2O	(DMSO)
AMIDINES			
			
R=	Me		(17.3)
	Ph		(15.0)
PROTONATED HETEROCYCLES			
DBU 			(11-12) (estimate)
DMAP 		9.2	6.95
			
R=	H (PPTS)	5.21	(3.4)
	t-Bu	4.95	(0.90)
	Me	6.75	(4.46)
	Cl, H	0.72	
HETEROCYCLES			
			(20.95)
			(23.0)
			(18.6)
		1,2,3 triazole	
			(17.0)
			(13.9)

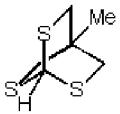
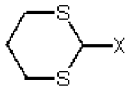
Substrate		pKa H_2O	(DMSO)
NITRILES			
			
X=	H		(31.3)
	CH_3		(32.5)
	Ph		(21.9)
	COPh		(10.2)
	$CONR_2$		(17.1)
	CO_2Et		(13.1)
	CN	11	(11.1)
	OPh		(28.1)
	N^+Me_3		(20.6)
	SPh		(20.8)
	SO_2Ph		(12.0)
HETERO-AROMATICS			
			(28.2)
			(30.1)
			(26.7)
			(25.2)
			(30.2)
			(30.0)

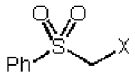
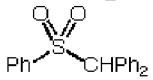
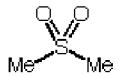
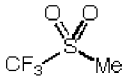
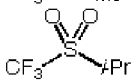
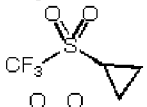
Substrate		pKa H_2O	(DMSO)
NITRO			
RNO_2			
R=	CH_3	≈10	(17.2)
	CH_2Me		(16.7)
	$CHMe_2$		(16.9)
	CH_2Ph		(12.2)
	CH_2Bn		(16.2)
	CH_2SPh		(11.8)
	CH_2SO_2Ph		(7.1)
	CH_2COPh		(7.7)
			
n=	3		(26.9)
	4		(17.8)
	5		(16.0)
	6		(17.9)
	7		(15.8)
IMINES			
			(24.3)

Substrate		pKa H_2O	(DMSO)
SULFOXIDES			
			
X=	H		(35.1)
	Ph		(29.0)
	SPh		(29.0)
			
X=	H		(33)
	Ph		(27.2)
	SOPh		(18.2)
			(24.5)
SULFONIUM			
$Me_3S^+=O$			(18.2)
			(16.3)
SULFIMIDES & SULFOXIMINES			
			
R=	Me		(27.6)
	i-Pr		(30.7)
			(24.5)
			(33)
			(14.4)
			(20.7)

Substrate	pKa H_2O	(DMSO)
PHOSPHONIUM		
P^+H_4	-14	
MeP^+H_3	2.7	
Et_3P^+H	9.1	
$Ph_3P^+CH_3$		(22.4)
Ph_3P^+*i*-Pr		(21.2)
$Ph_3P^+CH_2COPh$		(6.2)
$Ph_3P^+CH_2CN$		(7.0)
PHOSPONATES & PHOSPHINE OXIDES		
		
X= Ph		(27.6)
CN		(16.4)
CO_2Et		(18.6)
Cl		(26.2)
$SiMe_3$		(28.8)
		
X= SPh		(24.9)
CN		(16.9)
PHOSPHINES		
$Ph_2PCH_2PPh_2$		(29.9)
$Ph_2PCH_2SO_2Ph$		(20.3)

Substrate	pKa H_2O	(DMSO)
PROTONATED SPECIES		
	-12.4	
	-7.8	
	-6.2	
	-6.5	
	-3.8	
	-2.05	
$MeOH_2^+$	-2.2	
	-1.8	
	0.79	
SULFINIC & SULFONIC ACIDS		
	-2.6	
	7.1	

Substrate	pKa H_2O	(DMSO)
SULFIDES		
$PhSCH_2X$		
X= Ph		(30.8)
CN		(20.8)
$COCH_3$		(18.7)
COPh		(16.9)
NO_2		(11.8)
SPh		(30.8)
SO_2Ph		(20.3)
SO_2CF_3		(11.0)
$POPh_2$		(24.9)
$MeSCH_2SO_2Ph$		(23.4)
$PhSCHPh_2$		(26.7)
$(PhS)_3CH$		(22.8)
$(PrS)_3CH$		(31.3)
		(30.5)
$(PhS)_2CHPh$		(23.0)
		
X= Ph		(30.7)
CO_2Me		(20.8)
CN		(19.1)
$RSCH_2CN$		
R= Me		(24.3)
Et		(24.0)
i-Pr		(23.6)
t-Bu		(22.9)
$PhSCH{=}CHCH_2SPh$		(26.3)
BuSH	10-11	(17.0)
PhSH	≈7	(10.3)

Substrate	pKa H_2O	(DMSO)
SULFONES		
		
X= H		(29.0)
CH_3		(31.0)
t-Bu		(31.2)
Ph		(23.4)
$CH=CH_2$		(22.5)
CH=CHPh		(20.2)
CCH		(22.1)
CCPh		(17.8)
COPh		(11.4)
COMe		(12.5)
OPh		(27.9)
N^+Me_3		(19.4)
CN		(12.0)
NO_2		(7.1)
SMe		(23.5)
SPh		(20.5)
SO_2Ph		(12.2)
PPh_2		(20.2)
		(22.3)
		(31.1)
		(18.8)
		(21.8)
		(26.6)
		(32.8)
$(PhSO_2)_2CH_2Me$		(14.3)

DMSO:

JACS 97, 7007 (1975)
JACS 97, 7160 (1975)
JACS 97, 442 (1975)
JACS 105, 6188 (1983)
JOC 41, 1883 (1976)
JOC 41, 1885 (1976)
JOC 41, 2786 (1976)
JOC 41, 2508 (1976)
JOC 42, 1817 (1977)
JOC 42, 321 (1977)
JOC 42, 326 (1977)
JOC 43, 3113 (1978)
JOC 43, 3095 (1978)
JOC 43, 1764 (1978)
JOC 45, 3325 (1980)
JOC 45, 3305 (1980)
JOC 45, 3884 (1980)
JOC 46, 4327 (1981)
JOC 46, 632 (1981)
JOC 47, 3224 (1982)
JOC 47, 2504 (1982)
Acc. Chem. Res. 21, 456 (1988)
Unpublished results of F. Bordwell

Water:

Advanced Org. Chem., 3rd Ed.
J. March (1985)
Unpublished results of W. P. Jencks

THF:

JACS 110, 5705 (1988)