Agent	Capacity[a]	Speed[b]	Comments
$CaSO_4$	1/2 H_2O	Very fast (1)	Sold commercially as "Drierite" with or without a color indicator; very efficient. When dry the indicator ($CoCl_2$) is blue, but turns pink as it takes on H_2O (capacity $CoCl_2 \cdot 6H_2O$); useful in temperature range -50° to +86°. Some organic solvent leach out, or change the color of $CoCl_2$ (acetone, alcohols, pyridine, etc.).
$CaCl_2$	6 H_2O	Very fast (2)	Not very efficient; use only for hydrocarbons and alkyl halides (forms solvates, complexes, or reacts with many N and O compounds).
$MgSO_4$	7 H_2O	Fast (4)	Excellent general agent; very inert but may be slightly acidi (avoid with very acid-sensitive compounds). May be soluble in some organic solvents.
Molecular Sieve 4A	High	Fast (30)	Very efficient; predrying with a more common agent recommended (see below for details on molecular sieves). Sieve 3A also excellent.
Na_2SO_4	10 H_2O	Slow (290)	Very mild, inefficient, slow, inexpensive, high capacity; good for gross predrying, but do not warm the solution.
K_2CO_3	2 H_2O	Fast	Good for esters, nitriles, ketones and especially alcohols; do not use with acidic compounds.
NaOH, KOH	Very high	Fast	Powerful, but used only with inert solutions in which agent is insoluble; especially good for amines.
H_2SO_4	Very high	Very fast	Very efficient, but use limited to saturated or aromatic hydrocarbons or halides (will remove olefins and other "basic" compounds).

Table II. Desiccant Efficiency in the Drying[a] of Various Amines[b]

desiccant	residual water content,[c] ppm: Et_3N[d]	$(Me_2CH)_2NH$[e]	$NH_2(CH_2)_2NH_2$[e]
KOH powder	37 (23)[f]	750[g]	1370 (3700)[g]
4A sieves	33 (28)[h]	<25	<25
3A sieves	34	<25	<25
CaH_2	68 (34)[f]	150[i]	500[i]
Na	83	<25	150
BaO	89 (53)[f]	50	1100
CaC_2	98 (80)[f]	<25[i]	<25[i]
CaO	165 (56)[f]		
Al_2O_3	223 (223)[j]		
silica gel	451		
$CaSO_4$			>2500

Table II. Efficiency of Desiccants in the Drying[a] of DMF[b]

desiccant	residual solvent water content, ppm: 6 h	24 h	72 h	other conditions
3A molecular sieves	500	167	98	1.5[c]
P_2O_5	879	105		2[d]
CaH_2	641	227	102	94[d]
4A molecular sieves	454	134	108	
KOH (powdered)	1360	1110		303[d]
B_2O_3				890[e]
BaO	2060	1520	1140	
CaO	2090			
Al_2O_3	1970			
$CaSO_4$	2310	2030	1420	
K_2CO_3	2500			

[a] Static drying modes unless otherwise specified. [b] Desiccant loading 5% w/v; initial water content 2860 ppm (0.286% w/w). [c] Sequentially dried sample, 72 h. [d] Distilled Sample. [e] Stirring for 24 h followed by distillation.

Table IV. Efficiency of Desiccants in the Drying[a] of Acetone[b]

desiccant	residual solvent water content, ppm: 6 h	24 h	72 h	other conditions
B_2O_3				18[c,d]
				47[c,e]
				107[f]
3A molecular sieves	115	152	322[g]	322[h]
$CuSO_4$ (anhydrous)	1920	972	579	1700[h]
4A molecular sieves	331	887	1720	
$CaSO_4$	1590	1600		
BaO	1910	1870[i]		
P_2O_5	[j]			1970[f]
K_2CO_3	2057	2250		

[a] Static drying modes unless specified otherwise. [b] Desiccant loading 5% w/v; initial water content 2710 ppm (0.271% w/w), unless specified otherwise. [c] Initial water content 2890 ppm (0.289% w/w). [d] Stirred, distilled, and sequentially dried, 24 h. [e] Stirred for 24 h and distilled. [f] Dried for 24 h and then distilled. [g] Contamination (2%) by mesityl oxide. [h] Fractionated sample. [i] Contamination (12%) by mesityl oxide. [j] Brown-black solu-

Table V. Comparison of Desiccant Drying Efficiency for Dioxane and Acetonitrile[a]

desiccant	residual solvent water content, ppm: dioxane	acetonitrile
$CaSO_4$[b]	240	180
$CaCl_2$[b]	290	d
3A molecular sieve[c]	19	52
4A molecular sieve[c]	30	450

[a] Initial water content = 2500 ppm; drying time 72 h. Activation temperature: [b] = 225 °C. [c] = 350 °C. Drying temperature 27–30 °C. [d] $CaCl_2$ induces a base-catalyzed tritium exchange with acetonitrile which precludes determination; [e] desiccant loading = 5% w/v.

Table II. Desiccant Efficiency in Drying[a,b] of 1,2-Ethanediol[c]

desiccant	residual water content, ppm
3A sieves (bead)	1900 (1200,[d] 540[e])
3A sieves (powder)	360[f]
4A sieves (powder)	1900 (2070)[d]
$MgSO_4$	3600
CaC_2	990[g]
B_2O_3	k
BaO	k
CaO	k
distillation[h]	1080
benzene azeotrope	65[h,i] (76)[h,j]
Mg	150 (76)[h,j]
Al	400

[a] Static drying modes unless specified otherwise. [b] Water content assayed by the Karl Fischer method. [c] Desiccant loading 5% w/v with a drying period of 72 h unless specified otherwise; initial water content 2700 ppm. [d] 168-h drying period. [e] 600-h drying period. [f] Analysis was performed after settling of desiccant, ~6 h.

Table III. Efficiency of Desiccants in the Drying[a] of Me_2SO[b]

desiccant	residual solvent water content, ppm: 6 h	24 h	72 h
4A molecular sieves	978	471	332
3A molecular sieves	1050	448	269
none			
P_2O_5			
B_2O_3			
CaH_2	1560		1820
BaO	1450	1330	1770
CaO	2060		1740
Al_2O_3	1840	1900	1920
K_2CO_3	2280	2200	
KOH (powdered)	2130[h]		
$CaSO_4$	2140		

[a] Static drying modes unless otherwise specified. [b] Desiccant loading 5% w/v; i quentially dried sample, 72 h. [d] Fractionally distilled sample. [e] Distilled sample. [f] C for 24 h followed by distillation. [h] Yellow colored solutions.

Table I. Desiccant Efficiency in Drying[a,b] of a Pyridine[c] Series

desiccant	residual water content,[d] ppm: pyridine	2-methylpyridine	2,6-dimethylpyridine	2,4,6-trimethylpyridine
CaH_2	39 (14)[e]	84	248 (138)[e]	132
CaC_2	44 (10)[e]	71	519	8
BaO	101	27	360	33
4A sieves	106 (0.3)[f]		268 (126)	
3A sieves	117	55	200 (128)	47
benzene azeotrope	125	40	207	390
KOH powder	152	176	325	27
Na	388			
CaO	962		935	
silica gel	926			
Al_2O_3	1306			

[a] Static drying modes unless specified otherwise. [b] Water content assayed by the radiotracer technique. [c] Desiccant loading 5% w/v; initial water content 2500 ppm (0.25% w/w). [d] 24-h drying times unless specified otherwise. [e] 168-h drying time. [f] Sequentially dried sample, 24 h.

Table I. Desiccant Efficiency in Drying[a,b] of Some Common Lower Alcohols[c]

desiccant	residual water content, ppm: methanol[d]	ethanol[e]	2-butanol[f]	*tert*-butyl alcohol[g]
3A sieves (bead)	95	99	645 (9)[h]	428 (160)[i]
3A sieves (powder)[j]	940	18	14	13
Mg/I_2[k]	97 (12)[l]	50 (53)[m]		
CaH_2	125	99	17[n]	406 (20)[o]
Na[p]		1800[n]	2400[n]	406 (10)[o]
Na/dicarboxylic acid ester[q]		92[n]	36[n]	
4A sieves (bead)	440	401		406
5A sieves (bead)	475	875		
CaC_2	490	333 (199)[r]	409	430[n] (662)[o]
BaO	1000	s		
Ca	1000	s		860
K_2CO_3	s	s		750
CaO	s	s		770
KOH powder		s		
ion exchange resin		s		640

[a] Static drying modes unless specified otherwise. [b] Water content assayed by the Karl Fischer method. [c] Desiccant loading 5% w/v with a drying period of 24 h unless specified otherwise. [d] Initial water content 1010 ppm. [e] Initial water content 1500 ppm. [f] Initial water content 1000 ppm. [g] Initial water content 1080 ppm. [h] 96-h drying period. [i] 168-h drying period. [j] Analysis was performed after settling of desiccant, 3–6 h. [k] Weight of magnesium in accord with general practice, i.e., 0.5% w/v. [l] See text. [m] Weight of magnesium 2% w/v. [n] Distilled sample. [o] Initial water content 1670 ppm, distilled sample. [p] Weight of sodium 3% w/v. See ref 32. [q] Ratio of sodium to 2-butyl succinate for 2-BuOH and to diethyl phthalate for ethanol in accord with general practice (see ref 7c), i.e.; Na, 0.3 mol L^{-1}; dicarboxylic acid ester, 0.14 mol L^{-1}. [r] Stirred sample. [s] No apparent drying.

Table III. Dependence of Drying Efficiency on Desiccant Loading in the Drying of Grossly Wet Diethyl Ether[a]

desiccant	desiccant loading % w/v	residual solvent water content, ppm: 5 min	15 min	30 min	60 min	360 min	capacity[d] % w/w
$CaSO_4$	10[b]		11400	9200	10200	10700	2.8–3.9
	20[b]	6400	3800	2100			4.5
	20[c]	9700	7500	5800			3.1
$CaCl_2$	5[c]			2100	2100	850	19.6
	10[c]		2400	2100	1900	390	10.1
	20[c]	2100	1400	900			4.9

[a] Initial water content = 14 700 ppm; drying temperature = 22 °C. Activation temperature: [b] = 220 °C. [c] = 350 °C. [d] Given by weight of water absorbed per unit of desiccant expressed as a percentage.