Hydrophobic Interaction and Ion Exchange Chromatography Detergent Properties[1]

Physical Properties of Commonly Used Detergents

Detergent	MPt °C	Mol.Wt. Monomer	Mol.Wt. Micelle	Critical Micellular Conc. %(w/v)	M
SDS	206	288	18,000	0.23	8.0×10^{-3}
Cholate	201	430	4,300	0.60	1.4×10^{-2}
Deoxycholate	175	432	4,200	0.21	5.0×10^{-3}
C_{16}TAB	230	365	62,000	0.04	1.0×10^{-3}
Lyso PC (C_{16})	-	495	92,000	0.0004	7.0×10^{-6}
CHAPS	157	615	6,150	0.49	1.4×10^{-3}
Zwittergent 3-14	-	364	30,000	0.011	3.0×10^{-4}
Octyl glucoside	105	292	8,000	0.73	2.3×10^{-2}
Digitonin	235	1,229	70,000	-	-
$C_{12}E_8$	-	542	65,000	0.005	8.7×10^{-5}
Lubrol PX	-	582	64,000	0.006	1.0×10^{-4}
Triton-X-100	-	650	90,000	0.021	3.0×10^{-4}
Tween 80	-	1,310	76,000	0.002	1.2×10^{-5}

Chemical Properties of Commonly Used Detergents[a]

	Ionic Detergents							Non-Ionic Detergents					
Property	SDS	C_{16}	CHO	DOC	LYS	CHA	ZWI	OGL	DIG	C_{12}	T80	LUB	TNX
Strongly denaturing[b]	+	+	-	-	+/-	-	+/-	-	-	-	-	-	-
Dialyzable	+	+	+	+	-	+	+/-	+	-	-	-	-	-
Ion exchangeable [c]	+	+	+	+	-	-	-	-	-	-	-	-	-
Complexes ions	+	-	+	+	-	-	-	-	-	+/-	+/-	+/-	+/-
Strong A_{280}	-	-	-	-	-	-	-	-	-	-	-	-	+
Assay Interference	-	-	-	-	-	-	-	-	-	-	+/-	+/-	+/-
Cold Precipitates	+	+	-	+	-	-	-	-	-	-	-	-	-
High Cost	-	-	-	+	+	+	+	+	+	-	-	-	
Availability	+	+	+	+	+	+	+/-	+	+	+/-	+	+	+
Toxicity	-	-	-	-	-	-	-	-	-	-	-	-	-
Ease of purification	+	+	+	+	+/-	+	+	-	+	-	-	-	-
Radiolabelled	+	-	+	+	+	-	-	+	-	+	+	+	+
Defined composition	+	+	+	+	+	+	+	+	-	-	-	-	-
Auto-oxidation	-	-	-	-	-	-	-	-	-	+	+	+	+

a Key: SDS, Sodium Dodecyl Sulfate; C_{16}, Hexadecyl trimethylammonium bromide; CHO, cholate; DOC, Deoxycholate; LYS, Lysophosphatidylcholine; CHA, CHAPS; ZWI, Zwittergent 3-14; OGL, Octyl glucoside; DIG, Digitonin; C_{12}, $C_{12}E_8$; T80, Tween 80; LUB, Lubrol PX; TNX, Triton X-100. See reference 1 for structures. b Denaturing refers to disruption of secondary and tertiary protein structure. c Ionic detergents are unsuitable for ion exchange chromatography.

1. Tables taken from O.T. Jones, J. P. Earnest, and M.G. McNamee, "Solubilization and Reconstitution of Membrane Proteins," in Biological Membranes: A Practical Approach (J. Findlay, ed.) IRL Press (1986).

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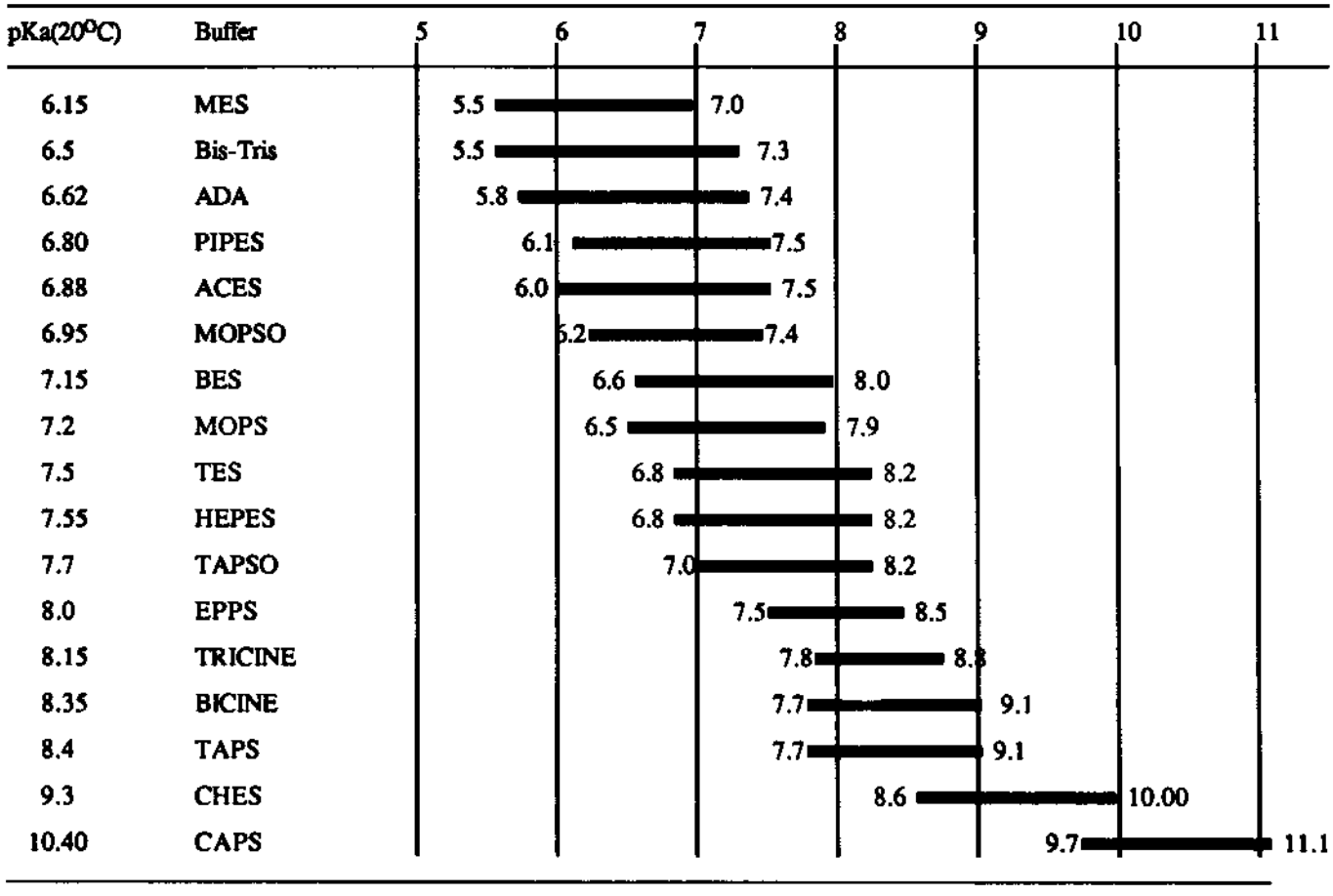
Hydrophobic Interaction and Ion Exchange Chromatography Biological Buffer Characteristic Chart

pH Properties of Common Biological Buffers



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