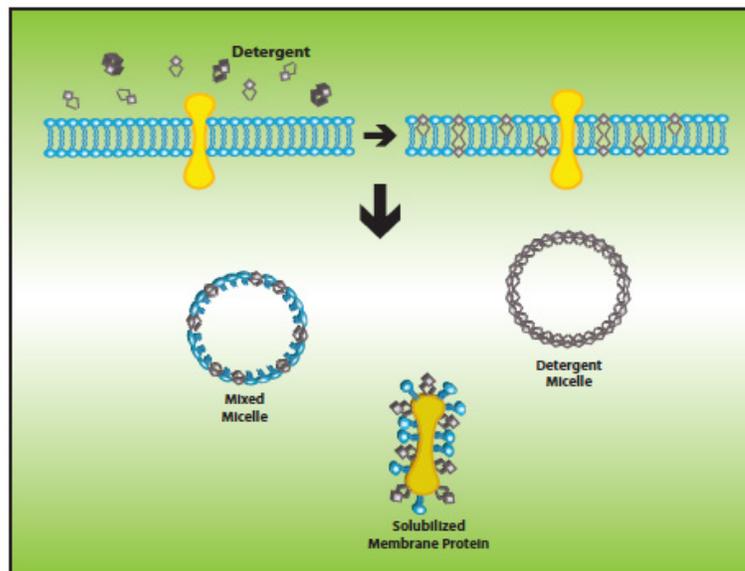


# Detergents & Non-Detergent Sulfobetaines (NDSBs)

Detergents are amphipathic molecules that contain both polar and hydrophobic regions which allow them to act as solubilizing agents. The polar region can form hydrogen bonds with water while the hydrophobic region tends to aggregate into micelles and associate with hydrocarbon and nonpolar domains. The fundamental properties of detergents include: the critical micellar concentration (CMC, the concentration above which micelles form); the Kraft Point (the temperature at which an equilibrium exists between the insoluble crystalline state, the monomeric detergent and the micellar state; this temperature is usually equal to the critical micellar temperature, CMT); the aggregation number (the number of detergent molecules within a micelle, which equals micellar MW/monomeric MW); the Hydrophile-Lipophile Balance (HLB, a measure of the hydrophilic nature of the detergent. An HLB between 12-20 is preferred for non-denaturing solubilization and > 20 for extrinsic protein solubilization); For non-ionic detergents, the Cloud Point is the temperature above the CMT where detergents become cloudy forming a detergent-rich phase and an aqueous layer. This is useful to separate integral membrane proteins from hydrophilic proteins after first solubilizing at low temperature (e.g. Triton X-114 has cloud point = 23 °C).

Detergents can be grouped into a few main classes: Ionic detergents ; Non-ionic detergents and Zwitterionic detergents. Ionic detergents have a charged headgroup (anionic or cationic) and are useful for the complete disruption of cells and denaturation of proteins for separation during SDS-PAGE. These can include anionic detergents like SDS, cationic detergents such as CTAP and anionic bile salts such as deoxycholate. Non-ionic detergents, often called non-denaturing detergents, are useful in the solubilization of membrane proteins since they are able to break lipid-lipid and lipid-protein interactions, but have a limited ability to break protein-protein interactions. They include low CMC detergents such as Triton X-100 and a NP-40 alternate which cannot be dialyzed away, uncharged bile salts like Big Chap (which can be dialyzed) and the very dialyzable (CMC ~ 25 mM) alkyl glucosides such as octyl glucopyranoside. Zwitterionic detergents protect the native state of proteins without altering the native charge of the protein molecules. In addition to solubilization properties alone, zwitterionic detergents are very useful for isoelectric focusing and 2D electrophoresis. Many synthetic zwitterionic detergents are known as sulfobetaines. Sulfobetaines retain their zwitterionic characteristics over a wide range of pH and are widely used for 2D gel electrophoresis.

Non-detergent Sulfobetaines (NDSB's) are a family of zwitterionic compounds that possess hydrophilic groups similar to the zwitterionic detergents but with much shorter hydrophobic chains that cannot aggregate to form micelles. Although not considered as detergents, NDSB's may improve the yield of membrane, nuclear and cytoskeletal proteins when used with detergents. The short hydrophobic groups combined with the charge neutralization of the sulfobetaine group results in obtaining higher yields of the membrane proteins. NDSB's also help reduce aggregation and aid in refolding proteins found in inclusion bodies and bacterial expression systems. The NDSB's are zwitterionic over a wide pH range, easily removed by dialysis and do not absorb significantly in the near UV range.



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## Detergents

Product Name	Cat. No.	Size	CAS #
ASB-14	1738	5 g, 25 g	216667-08-2
ASB-16	2136	1 g, 5 g	52562-29-5
BRIJ® 35 MegaPure™ Detergent, 10% Solution, Sterile-Filtered	B1184	25 ml, 50 ml, 100 ml	9002-92-0
CHAPS Detergent, 10% Solution, Sterile-Filtered	B1322	500 ml, 1 L	75621-03-3
CHAPS, High Purity	1545	10 g, 50 g, 100 g, 500g, 1 Kg	75621-03-3
Chenodeoxycholic acid	2831	1 g, 5 g, 25 g	474-25-9
DiscoveryPak™ Detergents Set I	S226	1 set	Multiple
DiscoveryPak™ Detergents Set II	S227	1 set	Multiple
EZSolution™ Digitonin	2082	1 ml	11024-24-1
Digitonin, Water-Soluble	2081	100 mg, 250 mg, 1 g	11024-24-1
Dodecyl-β-D-maltopyranoside	2036	1 g, 5 g, 25 g, 50 g	69227-93-6
Lithocholic acid	2187	1 g, 5 g	434-13-9
n-Octyl-β-D-glucopyranoside	1646	5 g, 25 g, 50 g	29836-26-8
NP-40 (10% in H <sub>2</sub> O)	2111	100 ml	N/A
NP-40 Substitute, MegaPure™ Detergent, 10% Solution	2127	50 ml, 100 ml, 500 ml	9016-45-9
Octyl-β-D-thioglucopyranoside	1782	1 g, 5 g, 50 g, 100 g	85618-21-9
Pluronic® F-127	2730	50 g, 250 g	9003-11-6
Pluronic® F-127, MegPure™ Detergent, 10% Solution, Sterile-Filtered	2731	25 ml, 50 ml, 100 ml, 500 ml	9003-11-6
SDS Solution (10% in H <sub>2</sub> O)	2102	100 ml	N/A
Sodium deoxycholate	2830	25 g, 100 g, 500 g	302-95-4
Sulfobetaine 3-16	1777	5 g, 25 g	2281-11-0
Taurocholic acid sodium salt	2829	5 g, 25 g, 100 g	145-42-6
Triton® X-114 (10%) Solution	B1015	100 ml, 500 ml	9036-19-5
Triton® X-100 Solution (10% in H <sub>2</sub> O)	2104	100 ml	9002-93-1
Triton® X-100, MegaPure™, Detergent, 10% Solution	2124	50 ml, 100 ml, 500 ml	9002-93-1
Triton® X-114, MegaPure™ Detergent, 10% Solution, Sterile-Filtered	2137	50 ml, 100 ml, 500 ml	9036-19-5
Tween® 20 Solution (10% in H <sub>2</sub> O)	2109	100 ml	9005-64-5
Tween® 20, MegaPure™ Detergent, 10% Solution	2125	50 ml, 100 ml, 500 ml	9005-64-5
Tween® 80, MegaPure™ Detergent, 10% Solution	2126	50 ml, 100 ml, 500 ml	9005-65-6
Tyloxapol (10% ) solution	B1159	50 ml, 250 ml	25301-02-4
Tyloxapol, MegaPure™ Detergent, (10%) solution	B1160	25 ml, 100 ml	25301-02-4
Tyloxapol, USP	B1158	5 g, 25 g	25301-02-4

## NDSBs

Product Name	Cat. No.	Size	CAS #
NDSB-195	2131	5 g, 25 g	160255-06-1
NDSB-201	2132	5 g, 25 g, 50 g	15471-17-7
NDSB-211	2133	1 g, 5 g, 25 g	38880-58-9
NDSB-221	2134	5 g, 25 g	160788-56-7
NDSB-256	2135	5 g, 25 g	81239-45-4

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