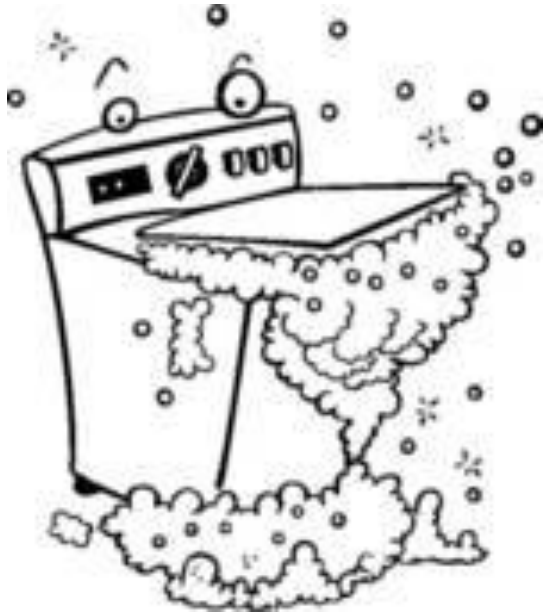


LAUNDRY

PRESENTED BY



CHEMICAL



WHY DO WE DO LAUNDRY?

➔ TO REMOVE SOIL

- Definition of soil
 - To make unclean, dirty or filthy, especially on the surface
 - To smirch, smudge or stain
- Different types of soiling
 - Outdoor stains - dirt, grass
 - Food stains – fat, protein, carbohydrate, sauces
 - Grease and oils
 - Clothing Stains – sweat, blood, feces, urine, make up

Need different laundry systems for removing different soils

LAUNDRY EQUIPMENT

COMMERCIAL LAUNDRY



LAUNDROMAT ~ 25 lbs

MOTEL / HOTEL / RESTAURANTS ~ 35 – 45 lbs

COMMERCIAL ~ 50 – 60 lbs

DOMESTIC LAUNDRY



OLD SCHOOL

~ 10 – 15 lbs



HIGH EFFICIENCY

*use $\frac{1}{3}$ to $\frac{1}{2}$ the amount of detergent



TUNNEL WASHER

~ 200 – 400 lbs

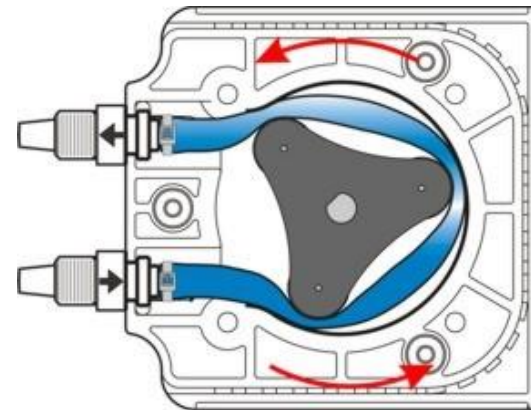
LAUNDRY CYCLES

- Machines may have fixed cycles, a card program, or microprocessors
- Settings control the water temperature, water level, time, mechanical action, chemical added and sequence
- Liquid laundry chemical is typically injected with a peristaltic pump
- Different programs for different types of laundry

PUNCH CARDS



PERISTALTIC PUMP



LAUNDRY CYCLES

- Flush – wets soiled fabrics + carries away loose soil
- Wash – breaks soil free from fabric, deflocculates soil + carries it away
 - detergent +/- alkali
- Bleach – removes stain
 - does not make “whites whiter”; this is accomplished by the detergent
- Sour – neutralizes excess alkali not removed by rinsing
 - without sour, linens may become yellow / brown
 - may cause rashes and bed sores
- Softener – shortens extraction time, eliminates static, improves ironing
- Rinsing – removes chemical + residual soil, prevents greying/yellowing
- Extraction – spin cycle removes water by centrifugal force

TYPICAL WASH CYCLE FOR WHITE TOWELS

- Flush WARM – 2 min
- Drain
- Wash HOT – 7-10 min w/ Detergent + Alkali
- Drain
- Wash HOT – 5-7 min w/ Bleach
- Drain
- Rinse WARM – 2 min
- Drain
- Rinse WARM – 2 min
- Drain
- Rinse WARM – 2 min
- Drain
- Rinse WARM – 2 min w/ Sour + Softener
- Drain
- Extraction

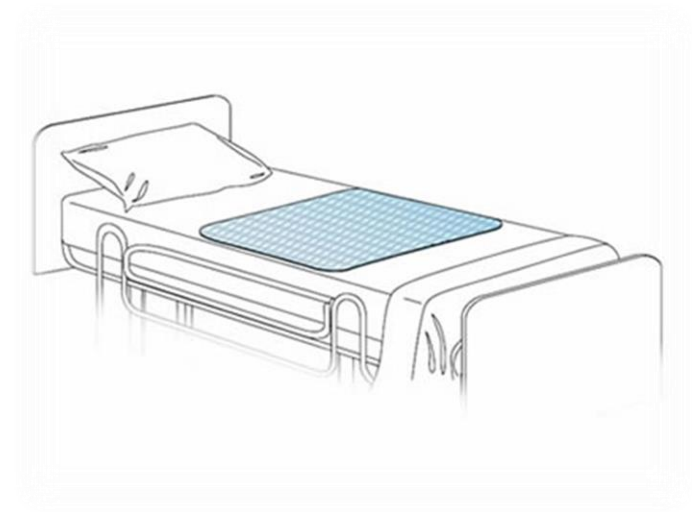
} Removes bleach
before Sour,
But not all of the
residual alkalinity



TYPICAL WASH CYCLE FOR SOAKER PADS

- Flush WARM – 2 min w/ Enzyme Detergent
- Drain
- Wash HOT – 12 min w/ Detergent + Alkali
- Drain
- Wash HOT – 5-7 min w/ Bleach
- Drain
- Rinse WARM – 2 min
- Drain
- Extraction
- Rinse WARM – 2 min
- Drain
- Rinse WARM – 5 min w/ Sour
- Drain
- Extraction

} Removes bleach before Sour,
But not all of the residual alkalinity



TYPICAL WASH CYCLE FOR ALKALI-SENSITIVE LINENS

- Flush WARM – 2 min
- Drain
- Wash WARM – 7-8 min w/ Detergent + Oxygen Bleach
- Drain
- Rinse WARM – 2 min
- Drain
- Rinse WARM – 2 min
- Drain
- Rinse WARM – 2 min
- Drain
- Rinse WARM – 5 min w/ Sour
- Drain
- Extraction



Laundry Chemical Use (mL) in a 50lb MAYTAG

CYCLE	DETERGENT	ALKALI	BLEACH	SOUR	SOFTENER	ANTI-CHLOR
Soakers (Diapers)	4	4	4	4	0	0
Towels	5	5	5	5	5	0
Sheets	2	2	2	2	2	0
Extra Heavy Soil Wash	17	17	17	18	0	19
Personal w/ Bleach	10	10	10	10	10	0
Personal w/o Bleach	13	13	0	13	13	0
Table Linens	4	4	0	4	0	0

PRE-SPOTTERS



- CITRUS PLUS (G506)
 - Alkaline, D-limonene and Butyl based solvent prespotter
- PRE-SPOTTER (L533)
 - Petroleum distillate based, high surfactant concentration
- BLOOD OUT (Y912)
 - Alkaline, ammonia based blood remover

PRESPOTTERS



- Wet stain and apply prespotter
- Work prespotter into stain
- Rinse with water
- Repeat until it no longer runs
- Work prespotter into stain
- Wash cycle with hot water
- Do not dry unless the stain is removed!

DETERGENTS



- LIQUID LAUNDRY DETERGENTS
 - Primarily used in commercial laundromats
 - Injected by peristaltic pumps according to the wash cycle program
- POWDER LAUNDRY DETERGENTS
 - Used primarily with top loaders and smaller laundry operations
- HARD WATER vs. SOFT WATER
 - Washing with soft water requires less detergent than with hard water
 - Hard water ions inactivate anionic wetting agents; requires chelators to prevent this
 - Typically the wash water level is higher in soft water conditions and lower with hard water conditions

DETERGENTS



- Main Components

- Optical brighteners – fluorescent compound that absorbs light in the ultraviolet spectrum and emits light in the blue spectrum, making whites look less yellow

LAUNDRY DETERGENT
WHITE LIGHT



LAUNDRY DETERGENT
ULTRAVIOLET LIGHT

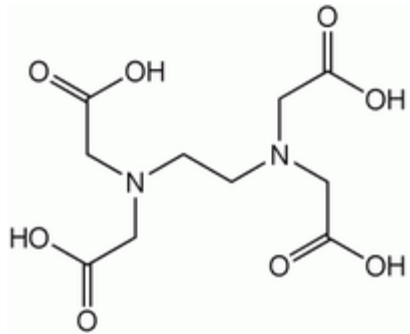


DETERGENTS

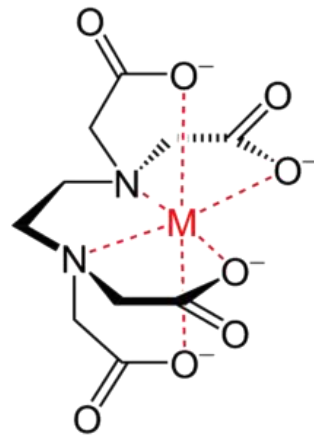


- Main Components

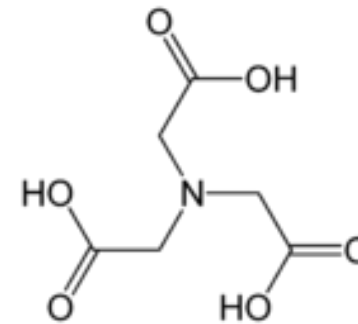
- Chelating Agents / Sequesterants / Builders – tie up hard water ions (Ca^{2+} , Mg^{2+} , Mn^{2+}) to prevent hard water scaling and make anionic surfactants work better (i.e. suds)



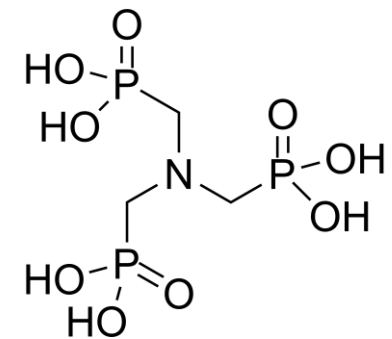
EDTA
(ethylenediamine tetra acetic acid)



EDTA chelating a
Metal Ion



NTA
(nitrilo tri acetic acid)



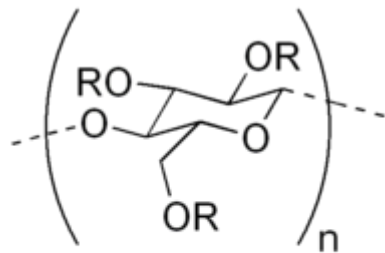
ATMP
(amino tri methylene phosphonic acid)

DETERGENTS



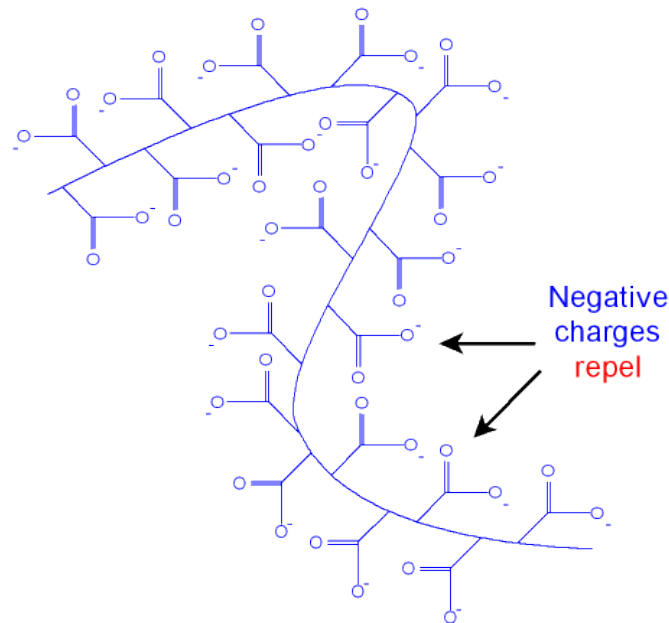
- Main Components

- Anti-redeposition agents – polymers with a negative charge that carry soil away in the rinse (soil has net positive charge from Aluminum and Silicon); and anionic surfactants



R = H or CH₂CO₂H

carboxymethyl cellulose (CMC) polymer



polyacrylate polymer

DETERGENTS

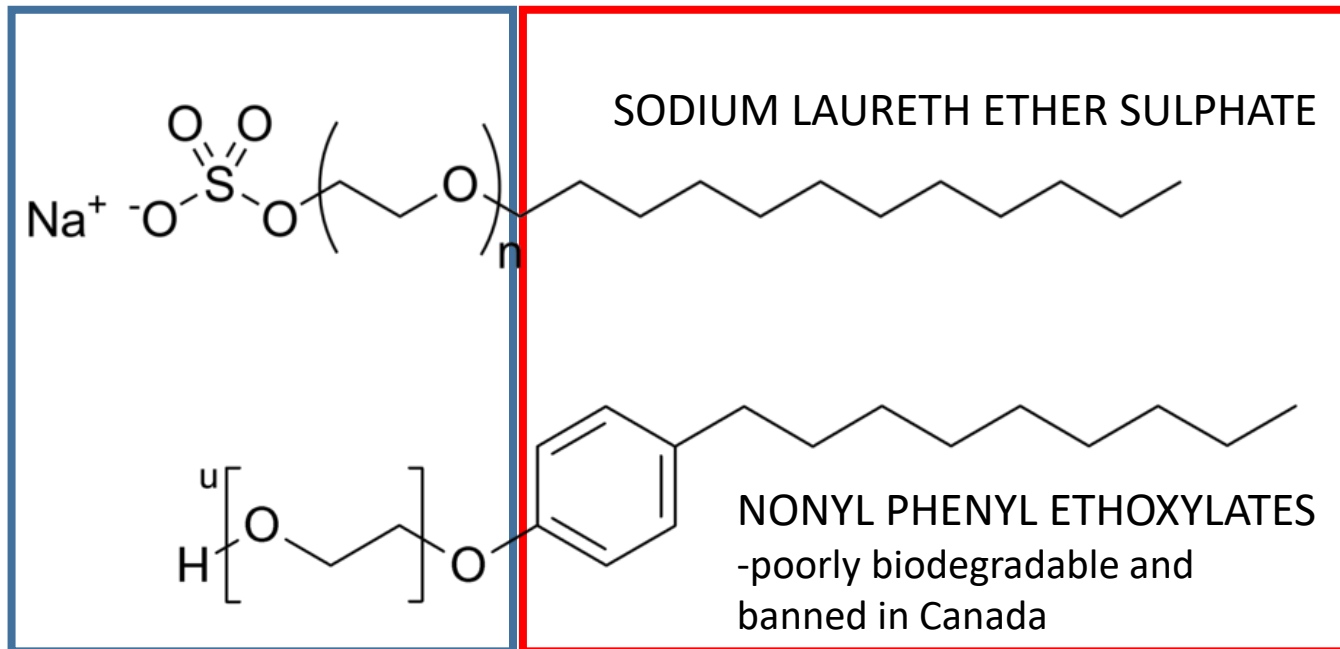


- Main Components

- Surfactants / Wetting Agents / Emulsifiers – amphipathic molecules that reduce the surface tension of water, increase wetting of fabrics, solubilize oils in water, produce foam

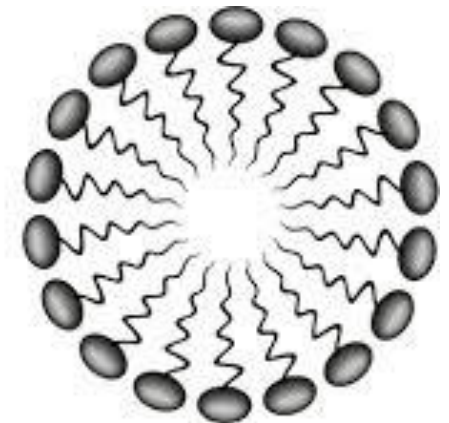
HYDROPHILIC

HYDROPHOBIC



hydrophilic group

hydrophobic group

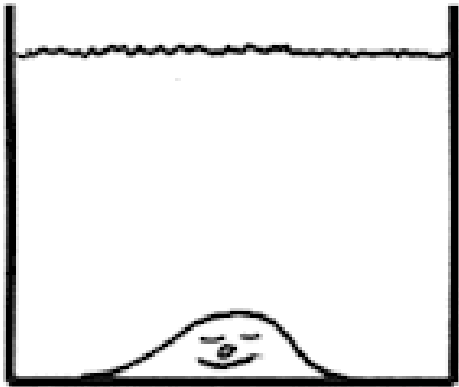


DETERGENTS

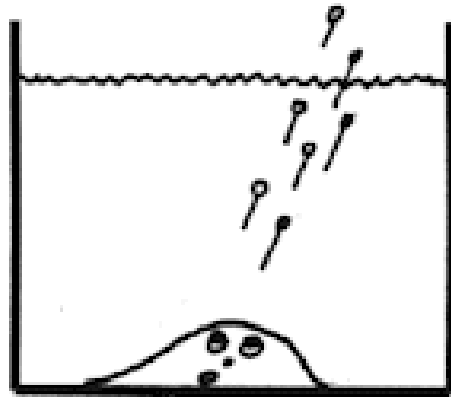


- Main Components

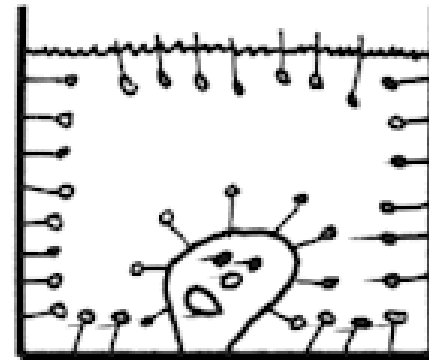
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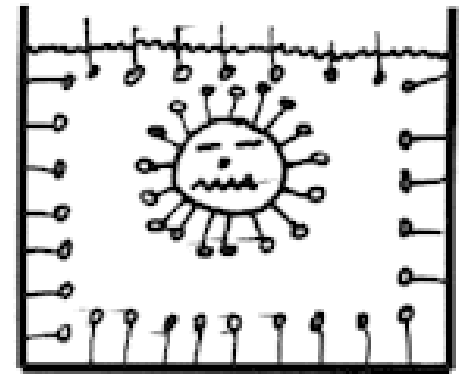
Oily soil.



Detergent attack on soil.



Orientation of hydrophilic and hydrophobic ends



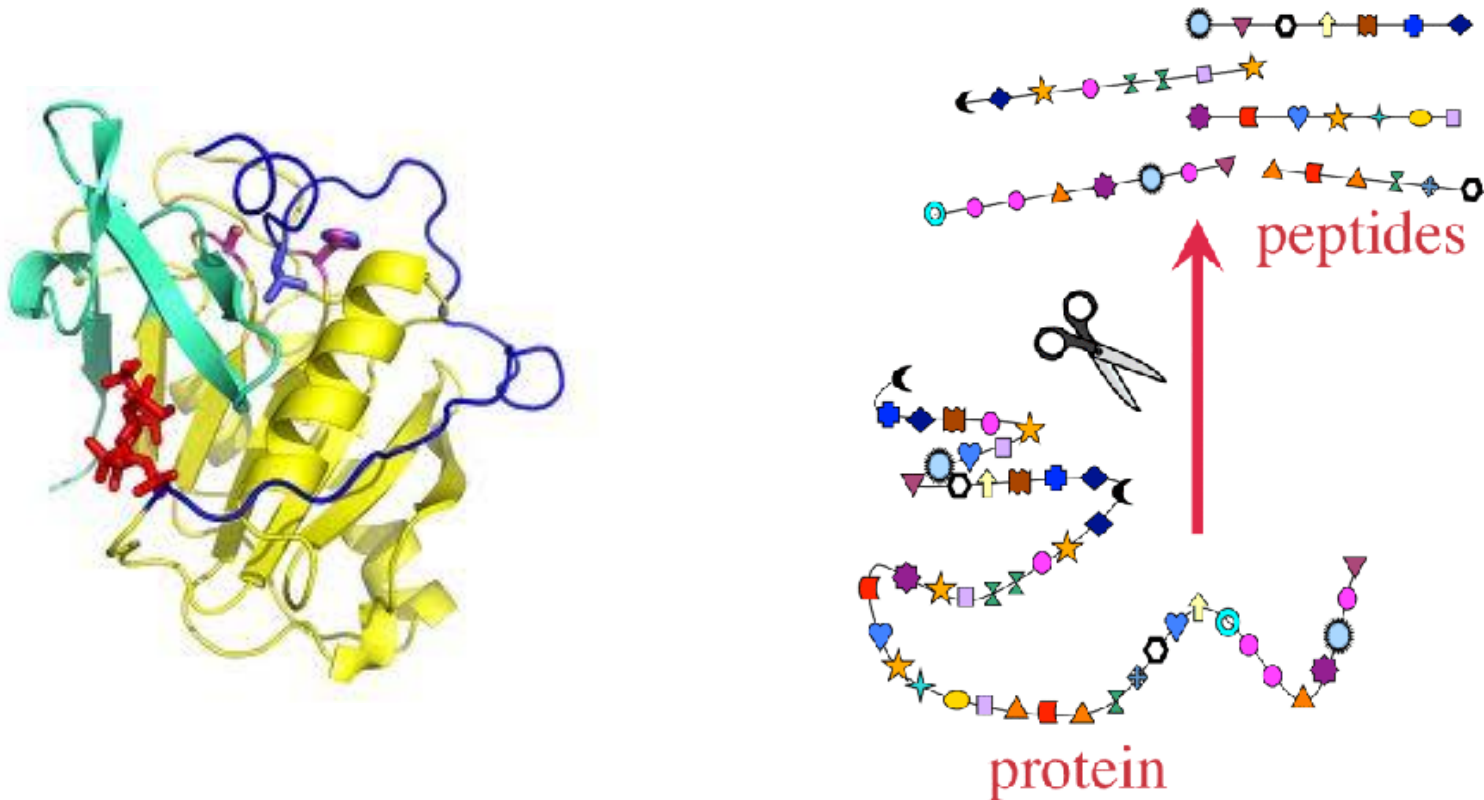
Soil is surrounded, lifted, suspended, and dispersed

DETERGENTS



- Main Components

- Enzymes – protein catalysts that break down fats or proteins or carbohydrates



DETERGENTS



- Main Components
 - Dyes and Fragrances



LIQUID DETERGENTS



- LIQUID LAUNDRY DETERGENT (L524)
 - Moderately alkaline, medium sudsing, high chelating
 - Use with Alkali for heavily soiled linens

- SUPER DETERGENT (L521)
 - Solvent and pine oil based emulsifying detergent
 - Good for greasy/oily laundry

LIQUID DETERGENTS



- LIQUID ONE SHOT DETERGENT (L523)
 - Excellent detergent with ALKALI built in
 - Ideal for camps or laundries with heavily soiled laundry that do not want to purchase a detergent AND an alkali product
- LIQUID ENZYME PRESOAK AND DETERGENT (L510)
 - Protease based, neutral detergent
 - For removal of blood, sweat, urine, meat sauces
 - Cannot use concurrently with Alkali or Bleach; use with warm water



LIQUID DETERGENTS



- **POWER WHITE** (Y955)
 - Viscous, neutral, economical detergent
 - Ideal for high-efficiency machines and domestic laundry
 - Closest thing to Liquid TIDE® Concentrate
- **TUNNEL DETERGENT** (Y960)
 - Similar to POWER WHITE but NOT viscous
 - Economical detergent for Tunnel Washing Machines

POWDER DETERGENTS



- X-400 LAUNDRY DETERGENT (L505)
 - Ostrem's #1 selling powder laundry detergent
 - Heavy duty, medium sudsing, medium alkalinity
- ENZYME LAUNDRY DETERGENT (L508)
 - Similar to X-400 + Protease enzymes
 - Excellent for removal of sweat, blood, protein
 - Do not use with Alkali or Bleach; use with warm water
- OXYZYME LAUNDRY DETERGENT (L502)
 - Similar to Enzyme Laundry Detergent + colour safe Oxygen Bleach

POWDER DETERGENTS



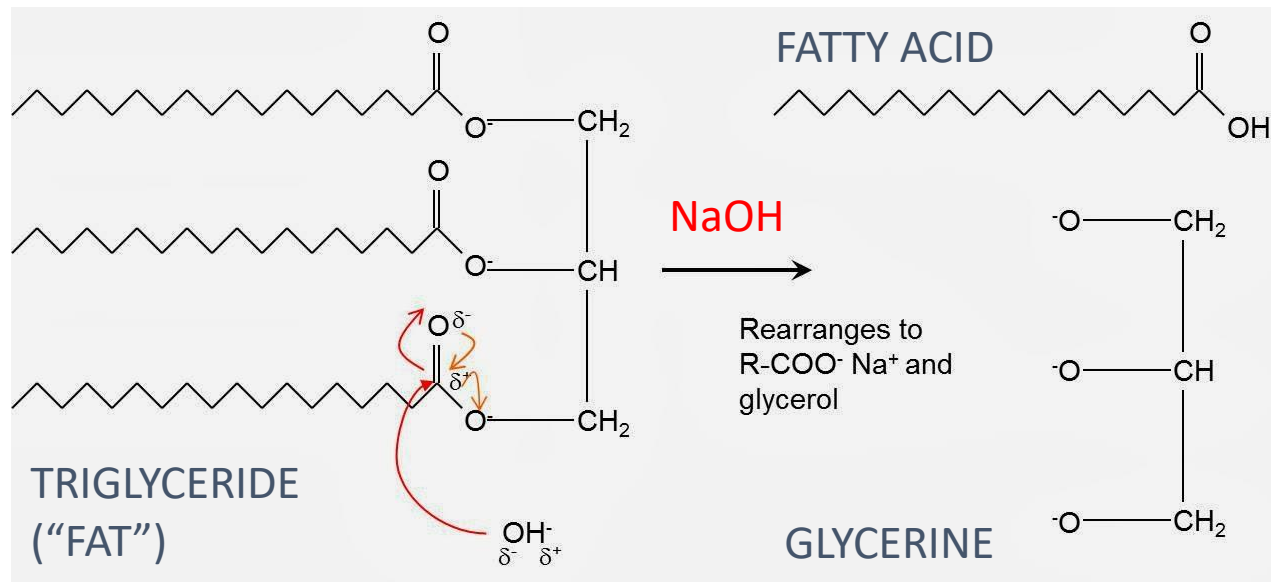
- **ONE SHOT LAUNDRY DETERGENT (L503)**
 - Heavy duty, highly alkaline detergent
 - No need for additional alkali to be added
 - Ideal for heavily soiled laundry
- **ONE SHOT EXTRA LAUNDRY DETERGENT (Y920)**
 - Very heavy duty, very highly alkaline detergent
 - High concentration of emulsifiers
 - Ideal for heavily soiled, greasy laundry

ALKALI



- Main Components

- Alkali: sodium hydroxide, potassium hydroxide, sodium carbonate, silicates
- Saponification – the process of making soap from fats/grease using alkali



GOAL: Use enough alkali to achieve a pH of 11.5 in the wash.

ALKALI



- LAUNDRY ALKALI (L507)
 - Heavy duty powder alkali
 - Supplement to powder detergent for heavily soiled linens
- LIQUID ALKALI PLUS (Y917)
 - Heavy duty liquid alkali
 - Supplement to liquid detergent for heavily soiled linens

DO NOT USE on wool, silk, fleece, delicates!

CHLORINE BLEACH



- LIQUID CHLORINE 12% SANITIZER (J436)
 - Strongest liquid chlorine bleach available
 - 12% sodium hypochlorite
- LIQUID WHITENER (L527)
 - 9% sodium hypochlorite
- LIQUID CHLORINE 6% SANITIZER (J437)
 - 6% sodium hypochlorite

GOAL: Use enough bleach to achieve 50 – 100 ppm chlorine.
pH 10 – 10.5 is ideal for bleaching - carryover from Alkali.

CHLORINE BLEACH



- I-16 BLEACH (L512)
 - Strongest powder chlorine bleach available
 - sodium dichloroisocyanurate
 - 16% available chlorine
- I-8 BLEACH (L511)
 - 8% available chlorine

GOAL: Use enough bleach to achieve 50 – 100 ppm chlorine.
pH 10 – 10.5 is ideal for bleaching - carryover from Alkali.

OXYGEN BLEACH



- LIQUID OXYGEN BLEACH (L537)
 - Strongest liquid oxygen bleach available
 - 35% hydrogen peroxide
- OXYGEN BLEACH (L513)
 - Alkaline powder with oxygen bleach crystallized
 - Ideal as a presoak for stained fabrics

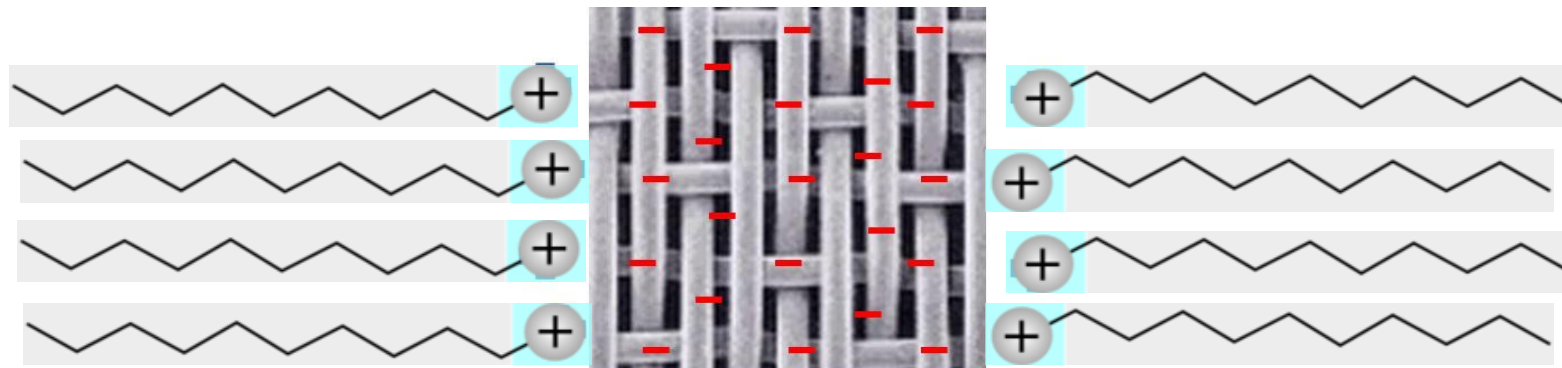


Colour-safe bleach
Ideal in high iron waters

FABRIC SOFTENER



- LIQUID FABRIC SOFTENER (L529)
 - Cationic (+ charged) fabric softener
 - Repels water, reduces dry time and prevents wrinkling
 - Use in the last rinse cycle
- SOFTENER CONCENTRATE (Y984)



Negatively charged fabric surface

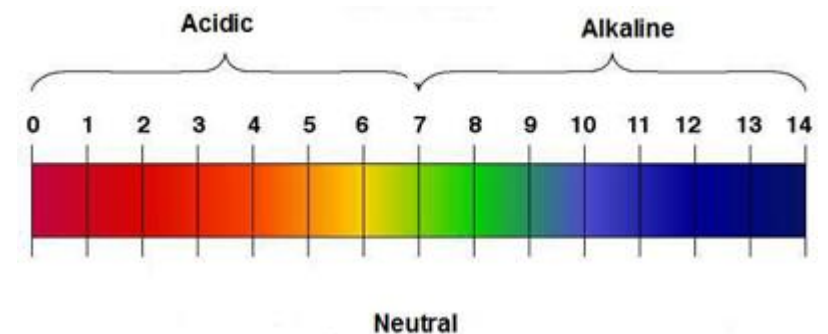
SOUR



- LIQUID SOUR (L528)
 - Acid product to neutralize residual alkalinity
 - Use in the last rinse cycle
 - Bring pH back to 6
 - Human skin has pH of 6.5
 - residual alkalinity in linens can cause a rash / bed sores
 - Prevents yellowing of linens from the use of alkali
 - Preserves tensile strength



- ULTRA LIQUID SOUR (Y973)



SOUR + SOFTENER



- LIQUID SOUR & SOFTENER (L530)
 - Combination product of sour and softener
 - Ideal for machines that have limited lines
- LIQUID SOUR & SOFTENER PLUS (L531)
 - Stronger acid content
- SOUR-SOFTENER CONCENTRATE (Y986)
 - Strongest

LAUNDRY SPECIALTY



- WATER CONDITIONER (L519)
 - Powder additive for poor water conditions (very hard water, high iron)
 - Prevents greying and yellowing, especially with chlorine bleach
- LIQUID WATER CONDITIONER (L535)
 - Liquid version of L519
- LIQUID RUST REMOVING SOUR (L539)
 - Liquid Sour used in last rinse cycle to remove rust and neutralize alkalinity
 - Also used to reverse set in rust discoloration

LAUNDRY SPECIALTY



- LIQUID ANTICHLOR (Y946)
 - Neutralizes residual bleach in high-bleach loads
 - Preserves tensile strength of linens and prevents deterioration
- NC 690 LIQUID LAUNDRY SIZING (L536)
 - Starch-based sizing for polyester and poly blends
 - Reduces extraction time, improves flatwork, reduces wrinkling



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