

POLYMER INCORPORATION WILL BE A GAME CHANGER FOR LIQUID DETERGENTS

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LIQUID Detergents have a market share to the tune of 70% in the US and European Nations. As of now, the Liquid Detergents (For laundry) have hardly any market share in the Indian Market as we are mostly making light duty non built liquid detergents. These are not effective enough to impact the detergent market significantly on grounds of performance.

Still, Liquid Detergents are catching up in India at a much faster rate, more in the unorganised sector as they can be manufactured in simple equipment and provides great convenience and ease to the customer. They have the added convenience of dispensing, easy dispersion and superior solubility in the wash baths and fast acting too. One of the biggest advantages of liquid detergents is the absence of salt and fillers which are used to cheapen detergent powders and cakes. Fillers are nothing but soils themselves. Whereas in Liquid Detergents, the same dilution can be achieved by the most harmless ingredient i.e. water.

However, they are certain concepts which are not very well understood by the formulators when it comes to formulating a stable, clear, hard water tolerant with long shelf life liquid detergent.

As we understand washing water contains Calcium, Magnesium & other inorganic salts which are termed as hardness of the water. They react with various ingredients of the detergents and forms insoluble compounds which deposit on clothing (called encrustation) & make them stiff & yellowish & we do not feel the goodness of the

washed cloth. Even new clothes lose their sheen and newness.

In order to mitigate this problem, ingredients which form soluble salts or complexes are incorporated. Sodium Tripolyphosphate (STPP) is an excellent detergent builder for controlling water hardness in cleaning process. A major advantage of STPP is its ability to form water-soluble complexes with ions that cause water hardness. This is good as far as detergent powder or cakes are concerned.

However in Liquid Detergent formulation STPP doesn't remain stable and it tends to hydrolyse to orthophosphate and pyrophosphate moieties.

Alternate product Tetrapotassium Pyrophosphate (TKPP) is soluble and stable but it is more expensive and again can not be used where phosphate ban exists. Sodium citrate and NTA are other alternatives but are costly. Polymers are best alternate builders for Liquid Detergents and are widely used in all developed countries. They have sequestering capacity similar to that of STPP and can very easily be incorporated in the formulation without worrying about the stability issue. They can be used at relatively low concentrations between 1 to 5% compared with typical inorganic builder concentrations of 20 - 30% . This brings great economy in the formulation without sacrificing on performance front.

These Polymers not only provide very good dispersancy of soil but also act as crystal growth inhibitors. The adsorption of polymer on soil particle increases the overall negative charge on the surface, which result in increased dispersancy , & minimum re-deposition of dirt particles on washed clothes.

Polymers are totally soluble and have synergistic effects with surfactants and give better clarity of the formulated Liquid Detergent. They are easily handled and processed, inexpensive, environ-

mentally safe and relatively nontoxic.

Polymers greatly increases the efficiency of costly Optical Brighteners. In optical brightener incorporated detergents, cations of hard-water neutralize the anionic charge of the OBs, leading to the loss of the important optical brightener properties of absorption of UV light and emission of visible light. Polymers help in stabilizing and solubilising the OBs in the liquid detergent formulation thereby efficiency increases considerably.

For coloring liquid detergents, polymers act as good dispersant for water soluble pigment.

Further to make good Liquid Detergents following points to be noted carefully:

- 1) Use Deionised or Distilled Water only.
- 2) Prevent microbial growth by incorporating preservatives
- 3) Proper Electrolyte balance should be maintained so as to avoid turbidity.
- 4) Measure pH – If for handwashing, it should be between 7-8 and for general purpose heavy duty liquid detergent it should be between 9-10.

To summarise – with in couple of years market share of liquid detergents especially heavy duty liquid detergents will increase manifold. All that is needed is to formulate a product which not only cleans cloths but keeps the dirt in suspension, prevents re-deposition of already removed soil and gives good performance in hard water conditions. Incorporation of Polymers like ACR 4500 (between 1 to 4%) does all the above performances and significantly increases whiteness/brightness maintenance in an economic way.

Big players of detergent powder and cakes have yet to come out with Liquid Detergents giving performance equivalent to their detergent powder/cakes. Polymer incorporation could be an answer.