LIQUID CLEANER OF TANKS AND EQUIPMENT

Crop protection products such as emulsions, plant oil-based products and solid actives can remain in a spray tank even after vigorous washing and rinsing. Due to the hydrophobic nature (hydrolysis) of oils, and most pesticide actives are extremely difficult to remove using water. With multiple modes of action Tankman ensures effective and safe cleaning.

ALKALINE HYDROLYSIS

Numerous active ingredients undergo a breakdown reaction in high-pH environments. Once the active ingredient degrades due to alkaline hydrolysis, the active ingredient loses its efficacy and is less harmful in future applications. The alkaline hydrolysis continues to break down active ingredients even after the rinse water is discarded, thus reducing the environmental impact of the actives.

This effect is often observed in insecticides such as organophosphates and carbamates. Figure 1 illustrates the hydrolysis of Profenophos, where the functional structure of the active ingredient is rapidly lost under high alkaline conditions. Active ingredient breakdown prevents unwanted toxicity in following spray applications.

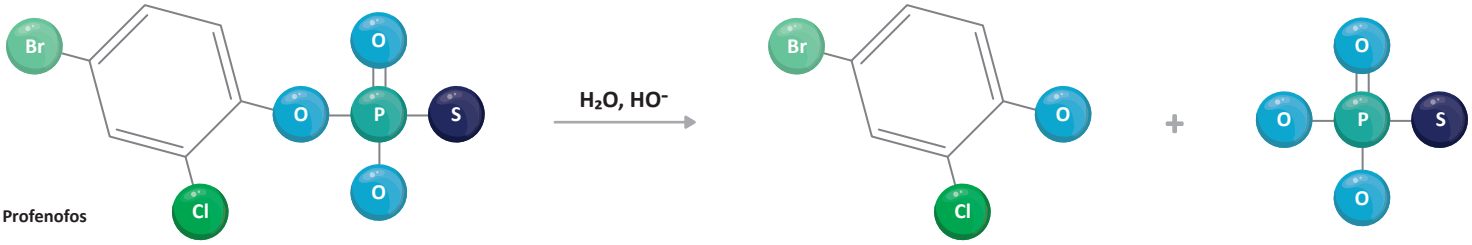

Figure 1: The Hydrolysis of Profenophos.

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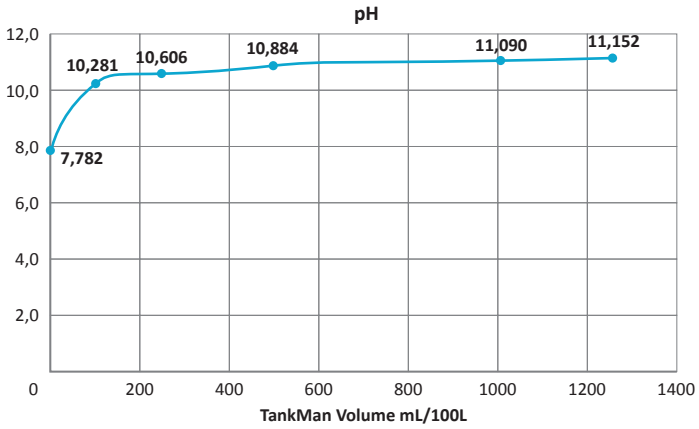
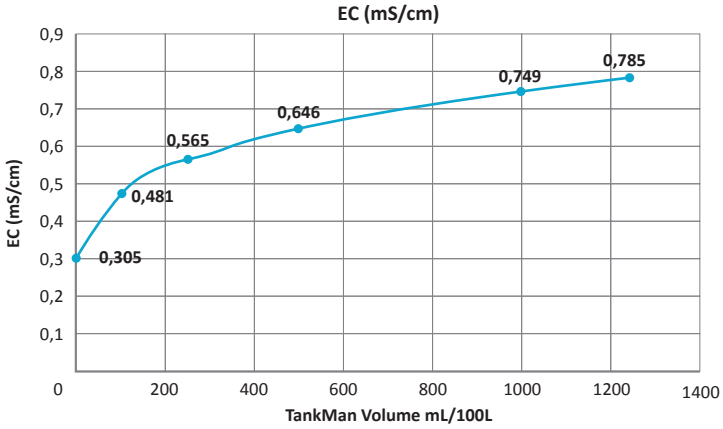
Tank Man™

Tank Cleaning Agent





SOLUBILIZATION OF ACTIVE INGREDIENTS

Some active ingredients have an increased solubility at higher pH ranges. The increased solubility takes the pesticide residue into solution allowing the unwanted active ingredient to be disposed of with the wash water. Taking Nicosulfuron (a Sulfonylurea compound) into consideration; an active ingredient that is required in low concentrations to be an effective herbicide - having a small amount of residue in the spray rig can lead to costly damages in follow-up sprays. Table 1 illustrates how the solubility of Nicosulfuron increases with increased pH when Tank man is added to the wash water.

SOLUBILITY OF NICOSULFURON VS PH @ 25°C	
pH	**Solubility in g/L**
5	0.4
7	12
9	39

Table 1: Increasing solubility of Nicosulfuron with increasing pH. (Data obtained from EXTOXNET).

SAPONIFICATION OF FATTY ACIDS

Saponification is the chemical process of converting a fat or oil into a soap. Vegetable oils contain Fatty Acid molecules. Tank man is a highly concentrated Ammonia solution that reacts with fatty acids present inside vegetable oils, making them water-soluble. Figure 2 illustrates the chemical reaction that takes place within the tank between the fatty acids (oils) and Tank Man.

Fatty acids are composed of organic compounds called carboxylic acids. When ammonia is added to the solution, the hydrogen molecules separate from the carboxylic acid which in turn makes the acid water soluble. The final result of this saponification process is a soap. This newly formed soap also assists in cleaning your tank by emulsifying other stubborn residues.

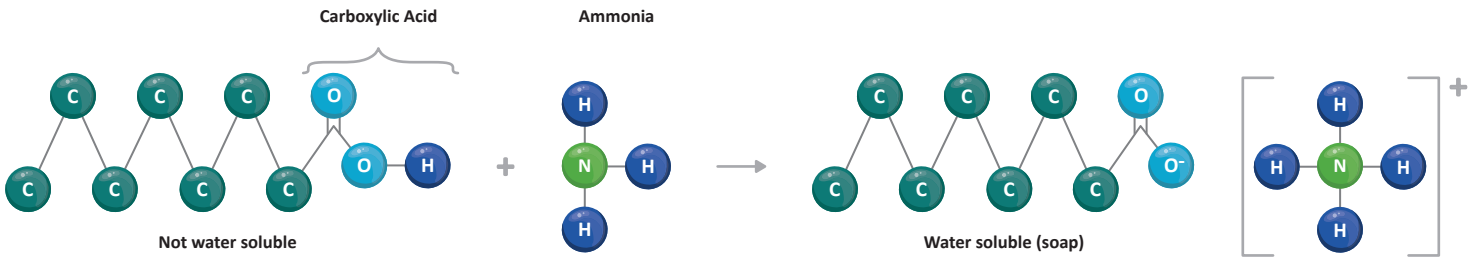


Figure 2: Saponification of a Fatty Acid with Ammonia.

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