BioBreak™ Emulsion Breaker Technology

BioBreak
Biopolymer Reverse Emulsion Breakers

NX Chemical

Biopolymers for Reverse Emulsion Breaking
Minimize Hydrocarbon and Solids in Water | Avoid Sludge and Slop Oil Formation

BioBreak™ Biopolymer Emulsion Breaker Technology from NX Chemical

Advances in biopolymer technology developed by **NX Chemical**, have led to the creation of the new product line called **BioBreak™**. The full **BioBreak** product line includes:

1. **NX OilFloc REB-30** (Primary Treatment: Manifold, Clusters)
2. **NX WaterFloc REB-36** (Secondary Treatment: Water Plant)
3. **NX WaterFloc REB-37** (Secondary Treatment: Water Plant)

The **BioBreak** biopolymer technology proved to deliver excellent results in operations of dewatering and clarification of produced water in both onshore and offshore operations.

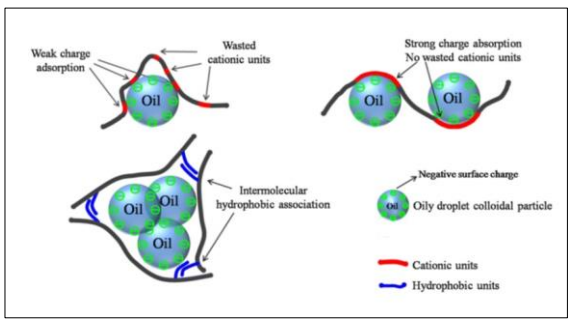
Unique Characteristics and Main Benefits:

- **BioBreak** biopolymers reverse emulsion breaker resulted in excellent clarification and separation of produced water with high hydrocarbon content.
- Superior performance compared to conventional flocculants of the same use.
- Prevents environmental impacts by delivering produced water free of oil and grease.
- Easy handling and simple dosage using existing chemical injection systems.
- Best cost-benefit for treating and clarifying produced water.
- 100% compatible with other **NX Chemical** emulsion breakers.
- Acts as a flotation aid and does not contain metal-based salts, hence, avoiding the formation of sludges, scale of deposits.
- BioBreak biopolymers by **NX Chemical** do not contain heavy metals in its formulation, therefore helps to avoid stabilization of emulsions when the separated crude is reprocessed.

How the Physical Reaction of NX OilFloc REB-30 Biopolymer works:

The coagulation process destabilizes the negatively-charged colloids by neutralization of charges by adsorption of oppositely charged (+) biopolymer **(NX OilFloc REB-30).** Essentially avoiding electrostatic repulsion of the colloids. The typical reactions of the **NX OilFloc REB-30** biopolymers with the emulsion from formation, formation water or produced water with high oil contents are illustrated in Figure 1. The application of **NX OilFloc REB-30** has proven to deliver excellent results in a number of oil production fields.

Figure 1



Root Cause Analysis | Proposed Solution | How We Solved the Challenge

Oil production fields and water treatment facilities encounter a number of problems caused by chemical additives used not suitable for produced water clarification. Whether water is used for disposal, secondary recovery or tertiary recovery the issues can lead to significant costs. Most of these problems are associated with reaction byproducts of inorganic polymers, nonionic polymers, anionic polyacrylamides used in water treatment generating sludges and deposits, which is cumulative in surface equipment, such as free water knock outs (FWKOS), gun barrels, 3-phase separators, skimming tanks, flotation units, filtration systems and others. This affects considerable the quality of the injection water, causing an increase in the injection pressure, plugging of the injection wells, problems in the dehydration process, oil production losses caused by the slop oil generated and high treatment costs associated with sludge formation. A photographic description of the sludges commonly formed in these processes, because of unsuitable chemical treatments is shown below. **Figure 2** displays the formation of sludges and how to **NX Chemical** evaluated the use of **BioBreak** biopolymers for its elimination.

Figure 2

The **BioBreak** biopolymer technology must always be evaluated through bottle tests, to select effective emulsion breakers. The emulsion breaker is added to each bottle together with the **BioBreak** biopolymer, with the objective of verifying the synergy between both materials and for confirming the quality of the separated water, quality of the interface and separation of the emulsion in the oil-water mixture.

Results and Conclusions from the use of BioBreak Technology:

1. The emulsion breaker can be dosed together with the BioBreak **NX OilFloc REB-30**, as they are compatible and do not generate interface problems in the FWKO'S, Gun Barrels, Skimming Tanks and Filtration Units.
2. The quality of the water in the first phase of separation is improved by 95%, removing the amount of oil in water from values of 5000 ppm to values less than 30 ppm.
3. The above allows to complement the addition of the other 2 biopolymers (**NX WaterFloc REB-36/REB-37**) as alternatives to give the final polish to the quality of the water, used for secondary, tertiary injection or disposal.
4. It was possible to achieve values of nearly 0 ppm (below detection levels) of oil in water and nearly 0 ppm (below detected level) of suspended solids at the outlet of the filtration units

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