

Marcus Oxidized Polyethylene Wax for Water Based Emulsions

Atmospheric Emulsification of Marcus 3400 and 3500 Polyethylene

Both Marcus M3500 and M3400 can be used to make high quality atmospheric non-ionic emulsions. M3500- with an acid value of 24mgKOH/g and a hardness of 5 has more functionality and therefore may slightly easier to emulsify. This may be preferable when emulsification is more difficult due to equipment limitations and / or in applications requiring a slightly softer wax.

A surfactant with slightly higher ethoxylation may work best with M3400.

Wax to Water Nonionic Emulsion Preparation

Non-Ionic Formulation (25% solids)

	<u>Percent</u>	
Marcus M3500		19.75
M3400	19.75	
Nonyl Phenol/Alcohol Ethoxylate	4.95	4.95
KOH (86%)	0.40	0.45
Monoethylene Glycol	0.80	0.90
Water	74.10	73.95

Comments:

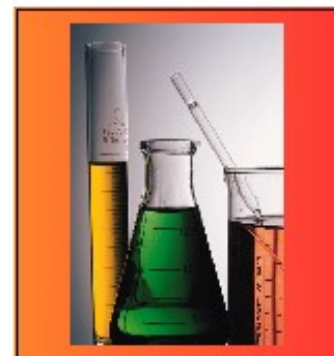
The recommended degree of ethoxylation is 9-10 moles. Ethoxylated surfactants can vary from supplier to supplier. Frequently the best results are obtained with a blend of surfactants of low and high degree of ethoxylation such that an average of 9-10 moles is achieved.

Procedure:

Mix oxidized Marcus Wax and surfactant and heat under agitation to a temperature of 125-135°C. While this is being done, a potassium hydroxide solution in monoethylene glycol is prepared. This is done by heating 1 part KOH with 2 parts of glycol (the dissolution process is violent and consequently heating should be gentle). This solution is viscous upon cooling and it is recommended that the solution be added to the wax melt hot. An alternative method of adding the KOH is as a solution in water. This is not recommended, however as there is risk of boiling and the wax melt can overflow the vessel. Allow the KOH to react with the oxidized Marcus wax for a short period of time before proceeding.

Pour the hot wax blend into demineralized water which has been preheated to 95-98°C. The vessel should be agitated such that a vortex is formed at the surface and the wax can be readily dispersed.

After all the wax melt has been added to the vessel the emulsion should be cooled rapidly while continuing to agitate. Improper agitation and/or slow cooling may result in crusting or creaming of the emulsion. Cooling can be facilitated by a double jacketed vessel or an external heat exchanger. Following cooling to room temperature a bactericide can be added to aid shelf life of the emulsion. The emulsion should then be discharged and filtered.



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