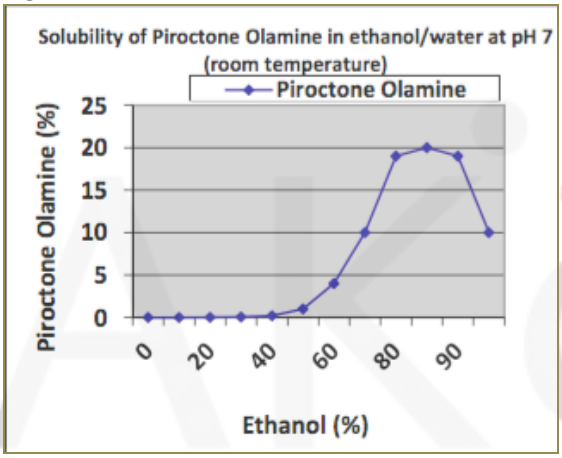
AKOMA™
FROM THE HEART

GENERAL PROPERTIES OF PIROCTONE OLAMINE

Solubility of Piroctone Olamine

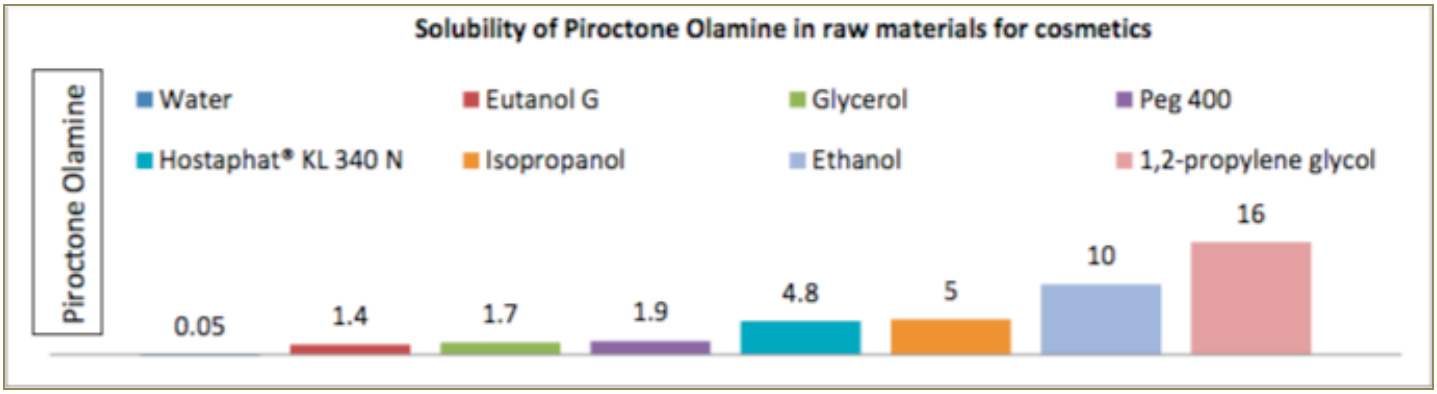
Figure 1.



Solubility

The solubility of Piroctone Olamine is greatly dependent on the pH. Generally speaking, its solubility in aqueous formulations is greater in the neutral and weakly alkaline ranges than in the acid range (formation of free acid). Piroctone Olamine does however have adequate solubility in the usual pH range (pH5 – 8) in commercial surfactant solutions and alcohol-water mixtures.
The solubility of Piroctone Olamine in ethanol water mixtures at pH 7 and 20 °C is shown in figure 1.

Figure 2. Shows the solubility of Piroctone Olamine in various solvents and important additives such as emulsifiers and solubilisers. Particularly remarkable is the product's good solubility in 1,2-propylene glycol



Akoma International (UK) LTD
Unit 9A Sawley Park
Nottingham Road
Derby
DE21 6AS
Tel: +44 (0) 1332 613 967
E-mail: support@akoma.zendesk.com

Solubility of Piroctone Olamine in various surfactants	(15% active detergent, pH 7, room temperature)
Alkyl ether sulphate sodium salt	1.1 – 1.4%
Lauryl sulphate sodium salt	approx. 2.8%
Sec. alkane sulphonate sodium salt	approx. 1.4%
-olefin sulphonate sodium salt	approx. 2.3%
Alkyl amidopropyl betaine	approx. 1.9%

Influence of the pH value

At a neutral pH a substantial part of the Piroctone Olamine exists in the form of free acid. The pKa value is about 7.4. Piroctone Olamine is chemically stable over a wide pH range. In the range that is important for practical purposes, namely between pH3 and 9, neither deterioration of the active ingredient nor impairment of its efficacy was observed even after prolonged storage.

Thermal stability

Piroctone Olamine is noted for good thermal stability. The high temperatures (up to 80°C) occasionally occurring in the manufacture of cosmetic preparations do not cause deterioration of the product or loss of efficacy.
Still, prolonged heating to high temperatures should be avoided if possible.
No decrease in the active ingredient content of an Piroctone Olamine shampoo (pH5.5 and 7.0) was observed after storage for 12 months at +40 °C.

Light stability

Storage of Piroctone Olamine containing preparations in daylight can cause a deterioration of the active ingredient, depending on the amount of UV light. It is therefore advisable to use coloured or opaque packaging materials. Stability tests should be carried out if transparent packaging materials are used.

Compatibility with cosmetic raw materials

Piroctone Olamine is compatible with most surfactants, additives and active ingredients used in cosmetics.
Concerning compatibility with perfume oils, those with aldehyde and keto groups may cause problems. Despite the anionic character of the active ingredient molecule, Piroctone Olamine can be combined without any problems with most cationic surfactants (quaternary ammonium compounds) and cationic active ingredients. In some cases the solubility of Piroctone Olamine in water is increased even further. Nevertheless it is advisable to carry out compatibility and stability tests when using these substances.

Influence on viscosity in surfactant systems

Studies have shown that Piroctone Olamine increases the viscosity of numerous surfactant systems. Fig. 12 shows the viscosity-increasing effect of Piroctone Olamine at concentrations of up to 1.0 %, using the example of a commercial surfactant combination (pH 7). This generally very beneficial property (economising on consistency

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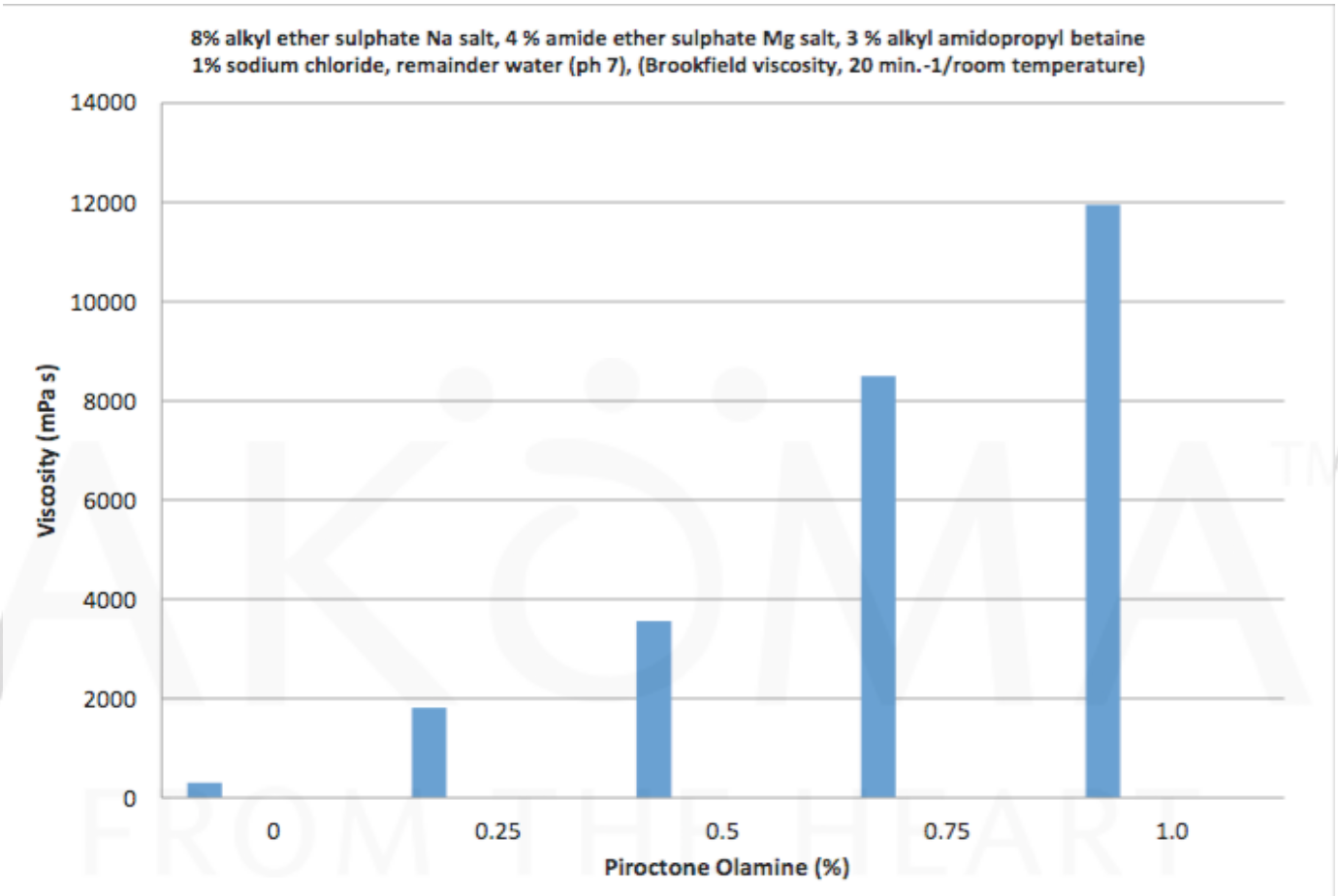
E-mail: support@akoma.zendesk.com

modifiers) should be taken into consideration when developing corresponding formulations.	

Figure 3. Viscosity increasing effect of Piroctone Olamine



Processing Information	
Aqueous or alcoholic-aqueous solutions of Piroctone Olamine have a pH of 9 – 10. Organic acids such as citric acid or lactic acid are highly suitable for adjusting the pH to the commercially required range between 5 and 7. It should be borne in mind that the solubility of Piroctone Olamine is somewhat reduced in the acid range, particularly with an extremely low active ingredient content.	It is advisable to carry out preliminary trials for colour change in the case of preparations to be coloured blue or pale green. Yellow, orange or red dyes are highly, suitable. If blue or green dyes are used, the raw materials should if possible be free from traces of iron. The following concentrations are used for the various cosmetic preparations: • Hair shampoos 0.3 – 1.0% • Hair tonics 0.05 – 0.1% • Hair conditioners 0.1 – 0.3% • Setting lotions / hair gels 0.05 – 0.2% • Hair creams 0.1% - 0.3%

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	• Deodorants 0.1 – 0.3%
In the manufacture of antidandruff shampoos the viscosity can be adjusted readily with any of the commonly employed consistency modifiers. In some cases when **Piroctone Olamine** is used, however, an additional and in some instances very great increase in viscosity is observed (see fig. 12). In the manufacture of shampoos or hair conditioners with **Piroctone Olamine** a temperature of 80 °C should not be exceeded if possible. Similarly, interactions with cationic surfactants can occur in a number of instances. In each case the compatibility should be checked by storage trials. In selecting dyes for colouring the preparations it should be borne in mind that in the presence of traces of iron (due to the formation of an intensely yellow iron complex) the formulation has an inherent yellow colour.	**Storage** **Piroctone Olamine** should if possible be stored in its original container at normal room temperature protected from moisture. If stored correctly in its original container **Piroctone Olamine** can be kept for at least five years. A safety data sheet is available on request.

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