



Newsletter

NOVEL BETAINE

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Betaine is known to improve the solubility of different chemicals. The effect of concentrated Betaine aqueous solutions toward Allantoin and Salicylic acid have been tested by Studio Rigano in Milan 2007.



Solubility of Salicylic acid and Allantoin

The solubility of Salicylic acid in water is very low, reaching 0,2% at 20°C. This can be depressed by the presence of other acids.

The use of higher concentrations of Salicylic acid in the finished formulations like eg. acne products is important. With concentrated solutions of Betaine this can be obtained.

The solubility of Allantoin in water is low 0, 5% at 20°C. The solubility is decreased by many substances, such as alcohol.

Preparing aqueous solutions of Allantoin is difficult also because the dissolving speed in room temperature is very slow.

SALICYLIC ACID

Solubility at 25°C

A 50/50 solution of Betaine and deionised water was prepared by mixing with magnetic stirrer for 2-3 minutes. The mixture was left to stand to eliminate the air bubbles. The solution was completely stable. Adequate preserving system should be considered if the solution is kept for many days.

Salicylic acid was added to the solution under magnetic stirrer in small portions (0,1%) until complete solution conditions were kept.

Same trials were repeated at 35°C. Salicylic acid dissolved easily up to 3,4% and after one week the solution was transparent.

Solubility in 70°C reaches 15% which can be considered quite exceptional.

Salicylic Acid	Solubility
2%	<ul style="list-style-type: none"> • Salicylic acid dissolves completely. • After one week solution is completely transparent.
2,2%	<ul style="list-style-type: none"> • Salicylic acid dissolves completely, but last amounts require some minutes to disappear. • After one week solution is completely transparent.
2,3%	<ul style="list-style-type: none"> • Salicylic acid does not dissolve completely. • After 15 minutes small insoluble crystals remain.



ALLANTOIN

Solubility at 25°C

The base solution of deionised water and Betaine was prepared. Allantoin was progressively added under magnetic stirrer in small portions (0,1%) until complete solution conditions were kept.

The trials were repeated at 35°C. 2% Allantoin was easily dissolved and after one day the solution was still transparent. After one week Allantoin crystallizes.

Solubility of Allantoin at 70°C Betaine—water solution reaches 6%.

Allantoin	Solubility
1,4%	<ul style="list-style-type: none"> • Allantoin dissolves easily; the last 0,1% addition requires more time for complete solution. • After one week the solution keeps stable and transparent
1,5%	<ul style="list-style-type: none"> • Allantoin dissolves, but with difficulty. • After 2 days Allantoin recrystallizes.

Conclusions:

- Salicylic acid can be dissolved by Betaine at concentrations that reach 20 times its standard water solubility at room temperature.
- Allantoin was completely solubilized at room temperature in a 50% Betaine/ 50% water solution up to 1,4% .
- Betaine increased 4 times the water solubility of Allantoin without heating. No visible precipitates were observed in the solution after 7days at 4°C. This is useful for cold stabilization of Allantoin.