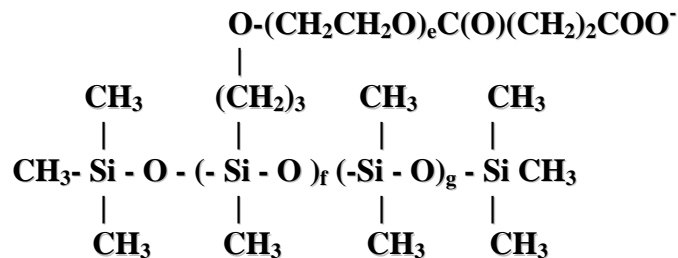
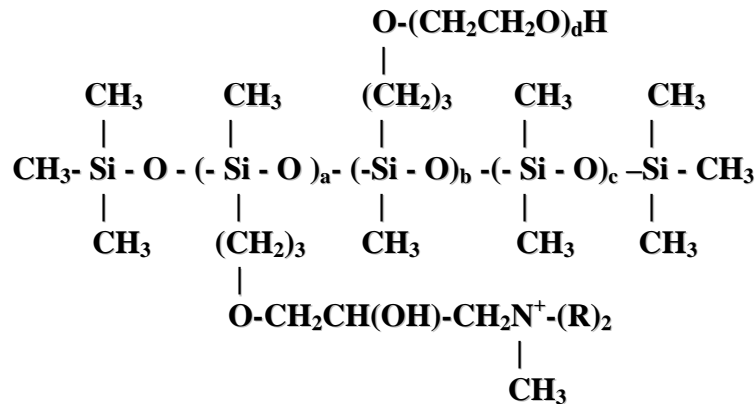


Products for Personal Care



SilPlex[™] J2-S

Siltech has developed this new series patent pending conditioning agent based upon complexation chemistry. We believe that this material represent a significant step in the development of highly effective conditioners for hair and skin. Specifically, SilPlex[™] J-2-S combines anionic and cationic silicone polymers conforming to the following structure;



The product has been designed to be soluble in water and compatible with anionic surfactants and provide outstanding conditioning at low concentrations. The nature of water and the hydrogen bonding that occurs between molecules of water makes water a unique material and in fact a material necessary to life as we know it. The interaction of ionic surfactants in dilute aqueous solution is important in formulation and utilization of personal care products.

Since anionic and cationic materials have an opposite charge they will attract each other and form a salt complex. It is the nature of this complex rather than the properties of the polymers themselves that determines how the formulations function. As ionic materials are added to water opposite charges attract and the same charges repel. As the concentration of point charges are increased, the solution becomes so ordered that either (a) the solubility product of the salt is exceeded and a precipitate occurs, (b) The viscosity of the solution increases or (c) the complex becomes insoluble. It is the nature of this interaction that is of interest to the present study. We have dubbed complexes that are made up on anionic and cationic surfactants in aqueous solution that thicken and remain clear soft complexes, while insoluble complexes are referred to as hard complexes. The chemical structure of each determines the hardness or softness of the complex. As the number of anionic and cationic species becomes equal, the number of interaction complexes will be greatest and the concentration of uncomplexed surfactant becomes lowest. It is for this reason that the highest viscosity of the blends of anionic and cationic surfactant occurs at equal amounts.

SilPlextm J-2S has been developed to maximize the disruption of the hydrogen bonding between water molecules, yet still maintaining water solubility. The result is a

complex that despite its water solubility achieves lowest free energy by deposition on the hair and skin. The result is a very effective conditioning for the hair and skin.

Salon Evaluation:

1. **Silquat J-208-1B** **A silicone quat**
2. **Silplex J2-S** **A silicone quat complex**

Shampoo Base

Ingredients	%
Water	Qs
Sodium laureth-2 sulfate	30.00
Cocamidopropyl betaine	7.00
Cocamide DEA	4.00
Na ₂ EDTA	0.10
Siltech materials	2.50
Germaben II	1.00
Citric Acid (25% soln)	Qs

All formula pH adjustments ranged from 6.65 to 6.80, specs being 6.3 to 6.8.

Comments:

- All products were yellow in color.
- The product made with Silplex J2-S was crystal clear, the one made with Silquat J-208-1B had a slightly hazy.
- The product with the SilPlex J2-S was crystal clear and did not affect the viscosity.

Foam Heights:

- The product with the Silplex J2-S was similar in both foam and viscosity to the control.
- The product with Silquat J-208-1B had lower foam and viscosity indicating interaction between the cation and anion

EVALUATIONS:

These two products were then evaluated for wet and dry combing on 10 inch Virgin Brown Hair. Three- 2 gram swatches were used with one gram of shampoo for each swatch. The water temperature used for wetting and rinsing the hair was a constant 25°C. All the swatches were rinsed until squeaky clean or for at least one minute. After the wet hair evaluation, the swatches were left to air dry then the dry comb evaluation was performed.

The scale used for all evaluations is from 1 to 5, 5 being the best.

WET COMBING EVALUATION			
	(Control) Water only	Silquat J208-1B	Silplex J2-S
Wet comb	1	4	5
Rinse off	3	4	5
Clean feel	1	4	5
Shine	3	4	5
Average	2	4.0	5

DRY COMBING EVALUATION			
	(Control) Water only	Silquat J208-1B	Silplex J2-S
Dry comb	2	4	5
Feel	2	4.5	5
Manageability	2	4	5
Shine	3	5	5
Clean look	2	4	5
Flyaway	2	3	4.5
Static	2	3	4.5
Residual feel	3	4.5	5
Average	2.25	4.00	4.875

Conclusion:

Silplex J2- S is a notable product for use in a 2 in 1 shampoo and for adding sheen and softness to color treated hair. It left the hair silky soft with no residual feel and the combing was without any tugging or pulling. The comb slipped right through the swatches. But best of all was the shine, which was far superior to the Silquat J208-1-1B for the wet or dry combing. The product provides conditioning comparable to high molecular weight dimethicone in a clear product.



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