NEW DIRECTIONS AUSTRALIA

Test Results Table for Experimenting With Different Natural Preservatives In A Cream Base

Natural Preservative System	Preservative INCI	Amount added	Ingredient form as supplied	Method for adding to base cream	Effect on our natural moisturiser cream formula. pH taken at room temperature, viscosity @ 3rpm, spindle TF96									Preservative Write-Up based on chemical and physical stability observed during the test period.
					Emulsifying wax natural (Cetearyl Alcohol, Cetearyl Glucoside @ 3.5%)									
					Immediate effect on pH of cream. Starting point: 6.07	pH Adjustment at Week 0 (to set pH at 5-6 range)	pH at week 10	pH Stability. Highly Stable = less than 0.1 change. Stable = 0.1-0.4 change. Pass = 0.41-0.65 change. Borderline= 0.66-1 change. Fail >1 change.	Viscosity at Week 0. Starting Point 92,191	Immediate Viscosity Change	Viscosity at Week 10.	Viscosity change from starting point cream with no preservative to 10 weeks mark.	Ranking based on pH and Viscosity Stability in this test only.	
Glyceryl Caprylate, P Anisic Acid	**Glyceryl Caprylate, P Anisic Acid**	0.7% + 0.3%	Waxy semi-solid + powder	Slightly heat together with a little glycerin from the formula to solubilise it. Then add during cool-down phase, homogenising to effectively disperse the mix	Reduced pH to 4.20	5.63	5.55	Highly Stable	127500	35% increase in initial viscosity	114400	24% Increase	1	This preservative performed best in both tests giving a reliable and stable increase in viscosity and a highly stable pH reading over the test period.
Plantaserv U	**Gluconolactone, Sodium Benzoate, Calcium Gluconate, Aqua**	2%	Powder	Added in cool down and homogenised to effectively disperse and dissolve powder	Reduced pH to 4.27	5	4.92	Highly Stable	150900	60% increase in initial viscosity	68750	25% Decrease	2	This preservative perormed exceptionally well for pH stability but was marked down slightly due to its more variable viscosity over time. Viscosity shoots up immediately after adding preservative then falls over time, dropping below the initial starting viscosity. Overall a very workable option in formulations with a low pH variability risk.
Plantaserv D	**Glycerin, Aqua, Sodium Levulinate, Sodium Anisate**	0.04	Liquid	Add in cool down phase with propeller mixer	Increased pH to 6.7	5.7	5.69	Highly Stable	157200	70% increase in initial viscosity	55620	40% Decrease	3	This preservative performed extremely well in pH stability over the test. That is very important for chemical stability and is why the ingredient scored well. It's viscosity performance was more eratic and could cause issues on filling. The preservative caused an initial jump of 70% to the viscosity but that eventually reduced to the starting point over 5 weeks then continuing on to settle at a 40% decrease in original viscosity. A formula tweak to reduce the impact of this would be required if this was going into full manufacture.
Plantaserv M	**Benzyl Alcohol, Salicylic Acid, Glycerine, Sorbic Acid**	1%	Liquid	Add in cool down phase with propeller mixer	Reduced pH to 3.39	5.08	4.93	Stable	170030	80% increase in initial viscosity	98750	7% Increase	4	This preservative was found to have good pH stability but it wasn't quite as exceptional as higher scoring options. The Viscosity change initially was dramatic and high but this settled to a more manageable viscosity, very similar to the starting point giving this a high overall score for usability.
Plantaserv N	**Glyceryl Caprylate, Glyceryl Undecylenate**	0.01	Waxy semi-solid to liquid depending on room temperature	Add in cool down phase with propeller mixer. Can be slightly heated to melt if preferred and depending on workspace temperature	Increased pH to 6.27	5.47	5.72	Stable	152800	60% increase in initial viscosity	122500	33% Increase	4	This preservative scored slightly lower than Plantaserv D for pH stability but was still very good and definitely workable in most formulations. The preservative gained points for its less dramatic viscosity change. Initially pushing the viscosity up by 60%, over the test period this settled at a 33% increase on initial unpreserved viscosity to a level that would be unlikely to cause problems in packing and retailing this combination.
Naticide	**Parfume**	1%	Liquid	Add in cool down phase with propeller mixer	Slight reduction in cream pH to 5.65	5.65	5.01	Pass	96560	5% increase in initial viscosity	100300	9% Increase	5	pH variability was what marked this option down in this formula as this has most impact on chemical stability of a formula. That said, the pH shifted less than 1 point during testing and as such would be deemed stable within most stability protocols. In addition, Naticide is not as vulnerable to pH changes so in some low-risk formulations the pH shift would be of little consequence. Viscosity wise, this was a highly stable and very usable option having a very minor impact all around.
AMTCide Coconut, Leucidal	**Lactobacillus & Cocos Nucifera Fruit Extract, Leuconostoc/Radish Root Ferment Filtrate**	2% each	Liquid	Add in cool down phase with propeller mixer	Increase in cream pH to 7.65	5.48	4.89	Pass	131600	40% increase in initial viscosity	105000	14% Increase	5	High pH variability also led to this blend being marked lower than other options. As with Naticide, this blend does have a good operational pH range so it may not cause a problem in some formulations. However, as large pH changes can affect chemical stability this variability must be considered. Viscosity wise the blend does lead to a significant increase in viscosity initially but that settles over the 10 weeks to a slight but not dramatic increase in final viscosity.
Plantaserv A	**Benzyl Alcohol, Aqua, Dehydroacetic Acid**	1%	Liquid	Add in cool down phase with propeller mixer	Reduced pH to 4.32	5.42	5.9	Pass	125000	35% increase in initial viscosity	66560	28% Decrease	6	This option performed least well in this test but that doesn't mean it failed. Both pH and viscosity stability were more than adequate for most applications. pH variability was at the higher end and viscosity increased initially before reducing significantly below the starting point over time. This would make the product slightly difficult to handle in a manufacturing environment, especially if it were to be filled straight away. For context, it must be noted that a viscosity of 65,000 - 95.000 would look and feel very similar in most in-use conditions so while the numnbers look big on paper, they don't necessarily lead to consumers experiencing the products very differently.