

FORMULATING TIPS USING SYNTRAN[®] POLYMERS

1. Order of Addition

Bimodal and Olefin/Graft:

For formulations that do not require heating above 45°C, add SYNTRAN polymer at later stages or end of formulation, all other ingredients should be well dispersed or solubilized prior to addition of polymer.

For formulations in which o/w emulsions need to be prepared and typically require heating above 65°C, add SYNTRAN polymer as last ingredient addition to water phase just prior to addition of oil phase. Homogenization of the emulsion is preferable but not a necessity.

2. pH Ranges

Bimodal and Olefin/Graft: Typical final formula pH range may be adjusted from 4.5-9.0 with citric acid, HCl, AMP, TEA and NaOH. When using Olefin/Graft polymers in formulations such as relaxers, depilatories and permanent waves, pH can be adjusted up to 13 with alkali.

Hydro-alcoholic (55% VOC or greater) solutions containing Bimodal polymers can be made clear to very slightly turbid by raising pH of solution to 8.7-9.0. For best results, add most of the alkali to hydro-alcoholic solution prior to addition of polymer (i.e.: ~1 part AMP for every 20 parts SYNTRAN PC 5100). Adjust pH further at end if necessary.

When pH < 6.0 is desired in a final formulation, it is advisable to add SYNTRAN polymer at a stage when pH of formula is > 6.0, and then lower with acid to desired pH.

3. Neutralization

There is **no** need to neutralize SYNTRAN polymers as required by many conventional hair spray polymers. pH of final formulation may be adjusted (see above) to meet particular final product requirements.

4. Agitation/Sheer Rate

There are no minimum or maximum agitation rates necessary to incorporate SYNTRAN polymers into a formulation. Conventional propeller type agitation at 250 rpm (lab scale) is sufficient to instantly disperse SYNTRAN polymers in solution. Use of homogenizers is not necessary.

5. Chemical Incompatibilities

Bimodal: One should test compatibility of Bimodal polymers with any anionic and cationic raw materials you are planning to use in formulation. There have been instances of incompatibility of SYNTRAN PC 5100 with certain anionic and cationic polymers. This has to be evaluated on a case-by-case basis. There have been some long-term instability issues found with formulations containing HEC gums.

Olefin/Graft: No known incompatibilities with conventional raw materials at this time. There have been some long-term stability issues found with formulations containing HEC gums.

6. Viscosity Effects

Bimodal and Olefin/Graft: SYNTRAN polymers tend to lower the viscosity of thickened systems, which utilize conventional rheology modifiers.