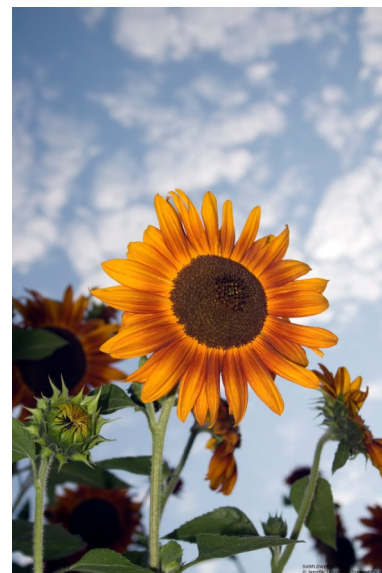


Trilene® for Biodegradable Lubricants- Sunflower Oil

September 2010

- Trilene® can be used to make **Ultimate Biodegradable** fluids.
- Trilene® is soluble in vegetable oil.
- Trilene® as a thickening agent for lubricants, hydraulic fluids and other functioning fluids.
- Trilene® is an excellent Viscosity Index improver.
- Trilene® has excellent shear stability suitable for marine, transportation & industrial gear oils.
- Trilene® is soluble in mineral oil & synthetic fluids .



Introduction

Trilene® liquid polymers are a family of viscous, low molecular weight ethylene-propylene copolymers and ethylene-propylene non-conjugated diene terpolymers. They are polymerized randomly to produce liquid elastomers with stable, saturated hydrocarbon backbones.

If Biodegradable, how biodegradable is the material?

Claims like "Environmentally Acceptable", "Environmentally Friendly", "Environmentally Preferable", and "Environmentally Responsible" are also used to describe a material that was produced by biodegradable materials or, in most cases, part biodegradable material without knowing if the whole formulation could be rated as biodegradable. In many cases, when the word "Biodegradability" is used, it meant that the lubricant product is more biodegradable than petroleum base oils or formulas.

A Biodegradable classification was needed for a very complex system, and the industry recognized the following tests to determine biodegradability of lubricants:

§ OECD 301B Modified Sturm

§ ASTM D-5864

§ CEC L-33-T-82

Biodegradability is not only a property or characteristic of a substance, but is also a system's concept, i.e. a system with its conditions determines whether a substance within it is biodegraded. When material is released into the environment, its fate depends upon a whole range of physiochemical processes and its interaction with living organisms.

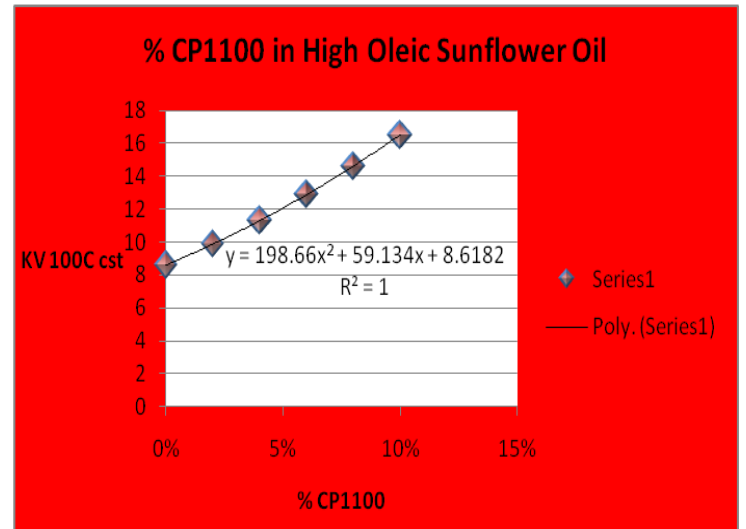
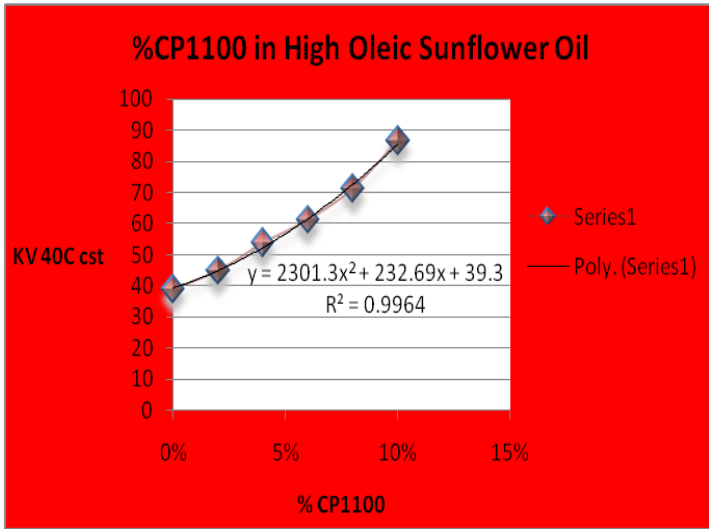
The most stable compound of carbon is **Carbon Dioxide**. All the more reduced organic compounds are thermodynamically unstable and will be randomly attacked by microbial enzymes, provided that they have some structural similarity to naturally occurring substrates.

Summarizing, **typical biodegradability values** in the CEC L-33-T-82 Biodegradability Test for common hydrocarbons are:

Mineral Oil	15 to 35%
White Oil	25 to 45%
Natural Oil & Vegetable Oil	70 to 100%
PAO	5 to 30%
Polyether	0 to 25%
PIB	0 to 25%
Phthalate & Trimellitate Esters	5 to 80%
Polyols & Diesters	55 to 100%

Sunflower Oil with Trilene CP1100

For “ultimate biodegradability” the customer can use CP1100 as a viscosity modifier. No mineral oil is needed!



High Oleic Sunflower Oil				
HO Sunflower Oil	CP1100	KV 100C	KV 40C	VI
100%	0%	8.62	38.93	208.87
98%	2%	9.88	44.84	214.93
96%	4%	11.29	53.72	209.73
94%	6%	12.9	61.17	216.94
92%	8%	14.61	71.1	216.57
90%	10%	16.52	86.48	206.8

For more information on these and other oils used with Trilene please contact

Lion Copolymer Marketing

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