

HPLC Monitors Acids in Nitrite-Free OAT Coolants



Since the first Organic Acid Technology (OAT) coolants hit the market in the 90's, engines and the materials used in today's modern cooling systems have evolved significantly. Now, a second generation of OAT coolants have been introduced to meet both the requirements of these advanced cooling systems and the demands of the global markets they serve.

Since second generation OAT formulations use twice the percent by volume of organic acids but do not contain nitrite, it has become increasingly important to analyze them to maintain adequate metal protection. For years, nitrite has been used to monitor coolants for acceptable levels of corrosion protection chemicals to prevent pitting and cavitation and to reduce acid and scale formation. High Pressure Liquid Chromatography, or HPLC analysis, is the best way to do this type of testing.

Analysts, Inc.'s Premium Extended Life Coolant test package gives users the ability to test and monitor the organic acid inhibitors and azoles found in newer coolant formulations. HPLC separates and measures the organic acids, which are the main inhibitors in today's Organic Acid Technology (OAT), Nitrite Organic Acid Technology (NOAT), Hybrid Organic Technology (HOAT), Nitrite, Amine & Phosphate-Free (NAP-Free) and Phosphate Organic Acid Technology (P-OAT) coolants.

Some of the more common organic acid inhibitors found in new coolant formulations are Benzoic Acid, Sebacic Acid, 2-Ethylhexanoic Acid, p-Toluic Acid, Adipic Acid and Octanoic Acid for iron, aluminum and lead corrosion protection. Common azoles used in these new formulations are Benzothiazole (BZT), Tolytriazole (TTZ) and Mercaptobenzothiazole (MBT) for copper and brass, or yellow metal, protection. Typically, coolant manufacturers use only two or three of these acids plus an azole to formulate OAT coolants, but they don't all use the same two. Analysts's HPLC analysis monitors all six of the most commonly used organic acids and the three azoles.

Adding HPLC analysis to your cooling system maintenance program can also determine when a system has been topped off with the wrong coolant formulation, one of the most common issues that affect proper cooling system maintenance. Incorrect top off dilutes the organic acids so important to engine metal protection leaving engine metals vulnerable to pitting, cavitation and premature engine failure. HPLC analysis will optimize the longevity of both the engine and the fluids used to protect it.