# Ion Chromatography Monitors Cooling System Issues, Identifies Deficient Maintenance Practices

Although higher operating temperatures have made today's engines more like boiler systems, significant changes have been made to improve the heat transferability of the fluids that serve them. When the cooling system is not properly maintained, engine or component issues will arise. Ion Chromatography can help in eliminating premature engine and component failure by identifying chemical reactions occurring with the cooling system and pinpointing deficiencies in maintenance practices.

**Ion Chromatography testing can identify:**

- Chloride or sulfate contamination from poor source water, combustion gas leaks or air leaks
- Degradation acid (glycolate, acetate, formate and oxalate) formation from the breakdown of ethylene or propylene glycol
- Electrolysis and the conversion of nitrite to nitrate
- Quality of coolant is adequate

**How Ion Chromatography Works:**

The sample, or analyte, is injected into a carrier fluid, or eluent. The mixture is then passed through a column containing a stationary fixed material, or adsorbent. Compounds contained in the analyte are then partitioned between the stationary adsorbent and the moving eluent/analyte mixture. Different dissolved materials adhere to the adsorbent with different forces. The ones that adhere strongly are moved through the adsorbent more slowly as the eluent flows over them. As the eluent flows through the column, components of the analyte will move down the column at different speeds separating from one another.

A detector is used to analyze the output at the end of the column. Each time analyte ions emerge from the chromatography column, the detector generates a measurable signal which prints out as a peak on the chromatogram.

**Premium Coolant Test Packages**

Analysts, Inc.'s Premium Conventional and Premium Extended Life Coolant Analysis should be used if a known issue is occurring or if the coolant is a virgin sample. IC should also be included in seasonal testing before the winter and summer months to monitor coolant condition before extreme temperature changes.

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**These premium test packages include:**

- Visual Inspection
  --color, oil, fuel, magnetic and non-magnetic precipitate, odor and foam
- pH
- % Glycol
- Freeze Point
- Specific Conductance
- SCA# (Supplemental Coolant Additives)
- Total Hardness
- Corrosion, Contaminant, Additive and Carrie Metals by ICP
  --Iron, Copper, Aluminum, Lead, Tin, Zinc, Silver, Calcium, Magnesium, Phosphorus, Boron, Molybdenum, Silicon, Sodium and Potassium
- Inhibitors, Contaminants and Degradation Acids by IC
  --Nitrite, Nitrate, Chloride, Sulfate, Glycolate, Acetate, Formate, and Oxalate

Laboratory coolant analysis is a proven means for eliminating preventable, premature engine failure and optimizing engine to fluid heat transfer. Adding IC to standard coolant testing not only monitors the system and its fluids but can also pinpoint shortcomings in maintenance management so that predictive maintenance program goals can be achieved.


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