

ChemScan[®]

PROCESS ANALYZERS

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Rev. 6/01

ChemScan[®] Method Summary #39 (On-Line COD Estimation) (UV Absorbance for COD Correlation in Water or Wastewater)

Organics Analysis Classifications

Organic compounds in water are present in a variety of particle sizes and oxidation states. Some of these carbonaceous compounds can be oxidized further by biological or chemical processes, with analytical methods such as the biochemical oxygen demand (BOD) or chemical oxygen demand (COD) used as the measurement standard.

Standard COD measurement techniques are the result of a complex series of laboratory procedures. Methods for analysis in the laboratory include various reflux methods which require careful reaction of a sample with potassium dichromate and sulfuric acid, capture of condensate and reaction with an indicator chemical. These methods are difficult to perform and expensive to automate.

ChemScan Analytical Method

On-line COD analysis using ultraviolet light absorbance can be performed using ChemScan Process Analyzers. The ChemScan UV-0254 provides a measurement of light absorbance that can be correlated with soluble COD after compensating for turbidity at a second wavelength. Other ChemScan analyzers provide a measurement of light intensity at 256 increments across the 200 nm to 450 nm wavelength range and can compensate for a wide variety of inorganic substances in the sample. Thus, a range of wavelengths can be used for the correlation calculation.

Because no two chemical substances absorb light in exactly the same pattern over the same wavelength range, a multiple wavelength analysis can be used to accurately measure multiple constituents and to correlate dissolved organic measurements with COD values. The result is an estimation of COD using only light absorbance as the measurement technique. Visible wavelengths are used to compensate for turbidity variations in the sample. A branch of mathematical analysis known as "pattern recognition" is used to process the multiple wavelength light absorbance information and calculate the COD measurement.