ON-LINE MONITORING OF TRANSITION METALS IN WASTEWATER

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ABSTRACT

Ion Chromatography, high performance liquid chromatography (HPLC), and flow injection techniques have been used for the on-line determination of anions, cations, metals, organics, and other chemical constituents in a variety of process streams. These on-line techniques have been used in several industries to provide the real time chemical information required for statistical process control and to identify process upsets as they occur.

Ion Chromatography has the distinct advantage of offering the determination of multiple components in a single analysis, as well as multiple sample point analysis. These capabilities have proved extremely beneficial in a number of industries.

INTRODUCTION

The discharge regulations for many species in wastewater are becoming more stringent, and penalties for discharging concentrations above the limits are rising. The National River Authority is conducting more spot checks to verify the accurate reporting of discharges. Many industries are faced with the need for continuous monitoring tools for rapid identification of pollutants in the waste treatment plant effluent. In many cases, staying within the discharge limits requires optimum performance of the waste treatment plant. Since common waste treatment processes involve the precipitation of heavy metals, the operation for such a process plant requires the addition of treatment chemicals.
The concentration of treatment chemicals required for optimum performance has been shown to vary with the concentration of metals in the incoming wastewater.

On-line monitoring of the incoming metal concentration can be utilized to control the addition of treatment chemicals. Such a control system can ensure that sufficient chemicals are present during peak treatment periods, as well as decreasing the consumption of chemicals during periods where high concentrations are not required.

Ion chromatography has a significant advantage over other analysis techniques for the on-line determination of metals. Other techniques available, such as Atomic Absorption, require the use of flammable gases in a process environment. Ion Chromatography is easily automated and can provide a profile of the metal content in a short period of time. (figure 1)

![Figure 1](image.png)

**Figure 1** detection of nine Transition Metal ions.