



Application Note AN-T-224

Aluminum content in coagulants and flocculants for wastewater treatment

Fast and accurate thermometric determination based on ABNT NBR 11176

Coagulation and flocculation are an essential part of treating both drinking water and wastewater. A common practice in overloaded wastewater treatment plants is chemically enhancing pre-cleaning to reduce suspended solids and organic loads from the primary clarifiers. Aluminum salts such as aluminum sulfate and polyaluminum chloride (PAC) are often used for this purpose. For the precise application and exact dosage of

the flocculant, it is important to accurately determine its aluminum content. The Al content, expressed as aluminum oxide (Al_2O_3), is additionally a parameter for calculating the precipitation capacity.

In this Application Note, the aluminum content is accurately and reliably analyzed based on ABNT NBR 11176 using the 859 Titrotherm equipped with a Thermoprobe HF and sodium fluoride as titrant.

SAMPLE AND SAMPLE PREPARATION

This application is demonstrated on PAC (polyaluminum chloride) and aluminum sulfate.

No sample preparation is required.

EXPERIMENTAL

An appropriate amount of sample is weighed into the sample beaker. Deionized water, hydrochloric acid, and acetate buffer solution are added.

While stirring, the solution is titrated until after the first endpoint with standardized sodium fluoride solution.

The determination is carried out with an 859 Titrotherm equipped with a Thermoprobe HF.



Figure 1. The 859 Titrotherm equipped with a Thermoprobe HF.

Table 1. Summarized results for aluminum in PAC (polyaluminum chloride) and aluminum sulfate samples expressed as Al_2O_3 .

Sample (n = 5)	Mean value Al_2O_3 in %(m/m)	SD(rel) in %
PAC (polyaluminum chloride)	10.7	0.8
Aluminum sulfate	7.7	0.5

CONCLUSION

Thermometric titration is an accurate and precise method to determine the aluminum content in different flocculants quickly. Using the 859 Titrotherm equipped with a

Thermoprobe HF allows a reliable determination of aluminum. The system offers fast analyses and user-friendly handling.

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CONTACT

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CONFIGURATION



859 Titrotherm komplett tiamo™

温度滴定のためのPC制御による自動滴定装置。 温度滴定のための付属品一式を含む(10 mLのビュレット、プロペラスターラー付き滴定スタンド、サーモプローブ、滴定容器、*tiamo*™ light)。



Thermoprobe HF

HFを含む媒質における859 TitrothermによるTETのための高精度の温度センサー。

Thermoprobeは短い反応時間と高い分離度を有し、ごくわずかな温度変化をも正確に捉えることができます。

このセンサーは、酸性の、フッ化物を含む溶液にて使用することができますが、有機性溶媒に対する耐性はありません。これは以下の用途などに適しています：

- ナトリウムの測定
- エッチング槽の滴定