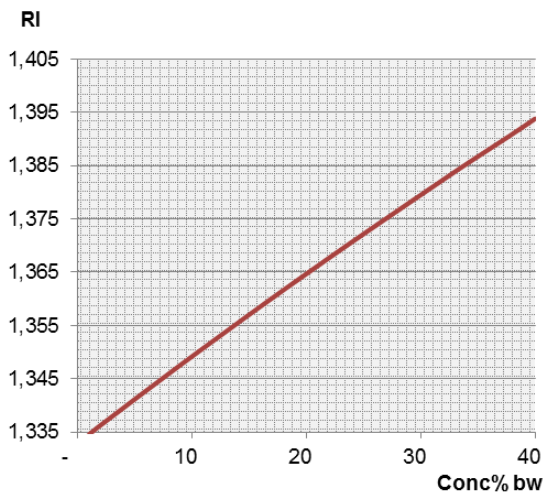


## AMMONIUM SULFATE (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>

### Typical end products

Inorganic salt with a number of commercial uses, e.g. soil fertilizer

Chemical curve: Ammonium Sulfate, (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, per Conc% b.w. at Ref. Temp. of 20°C



### Introduction

Ammonia (NH<sub>4</sub>) can be present in underground water as an impurity as a result of backward sewerage and drainage system, inadequate wastewater and solid waste disposal and treatment, or based on the nature of a certain area hydrogeology. Ammonia is undesirable in water because ultimately it gets converted into nitrites and nitrates which cause lacks of vitamin and if combined with other components can cause cancer. Moreover, elevated ammonia concentration can create favourable conditions for intensive growth of aquatic organisms, including

algae, which leads to deterioration of commodity water quality, especially its clarity, smell, taste and bacterium contamination.

### Application

For ammonia treatment in underground water caustic soda (30%), activated carbon and Ferric chloride (FeCl<sub>3</sub>) are used. Caustic soda is a chemical reagent, pH-regulating, ion exchanger regenerating agent, catalyst, etching or cleaning agent. It leaves no residual colour.

Activated carbon is used as filter media for dissolved organics as well as colour-, taste- and odour-causing compounds removal. It helps improve adsorbing capacity of ammonia.

Ferric chloride is a coagulant used for the treatment of turbidity and additionally for the removal of colour, natural organic materials and arsenic from the raw water.

The ammonia is stripped away from the process. Sulfuric acid (50%) is used as a stripping medium. Sulfuric acid added to the adsorption tower converts ammonia into ammonium sulfate ((NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>). Ammonium sulfate is an inorganic salt and can be sold with commercial value. Its most common use is as a soil fertilizer.

K-Patents refractometer PR-23-M is measuring the ammonium sulfate concentration in-line. If the value is correct, ammonium sulfate can be stored for further use, if not, the product is further recycled and adsorption process is adjusted accordingly.

## Installation

K-Patents Teflon Body Refractometer PR-23-M provides in-line measurements of ammonium sulfate concentration. It is important to constantly monitor the ammonium sulfate concentration value in order to regulate the process correctly, remove or further recycle the product. Target concentration is about 30.8%.

The mounting point of the refractometer is at the outlet of the adsorption tower.

## Instrumentation



## Description

Teflon Body Refractometer PR-23-M. A compact refractometer for chemically aggressive solutions and ultra-pure fine chemical processes. Connected to the process by a G1/2" female or a 1/2" NPT process connection. It has a built-in flow cell designed to keep all metal and other easily corroding parts from coming into contact with the process liquid.

Measurement range:

Refractive Index (nD) 1.3200 – 1.5300, corresponding to 0-100 % by weight.