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WATER NEWS

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EDITORIAL

BASIC QUESTION

Groundwater quality

When, in the summer of 2006, investigation results became known to the effect that the ozonisation of water could give rise to the formation of an unwanted and possibly carcinogenic by-product, many people questioned the practice of ozonisation as a part of water treatment. The fact that the unwanted substance arose as a consequence of the oxidation of a metabolite of the active agent tolylfluanide that is disseminated into the environment as a „plant health“ product was deliberately ignored.

Tolylfluanide is the main active agent of the plant health products Euparen and Folicur, which were used especially in fruit, berry and vegetable cultivation. For this reason, its approval is currently suspended until the end of 2007.

The question arises as to whether this is a problem of water treatment with ozone, or whether it is more of a problem brought about by a lack of investigation in the course of approving plant health products.

The fact is that more and more harmful or undesirable chemical substances are being detected in the ground water. Not all of them mutate into harmful substances.

But the same applies to them all: They have no good reason to be in the groundwater. And this is why every sensible precautionary measure should be taken to keep the groundwater clean.

The experiences with atrazine and nitrate were sufficient to show how difficult it is to eliminate substances from the aquatic system once they have been introduced into groundwater cycle.

The best option is therefore not to approve such substances in the first place.

Manfred Brugger

TECH TALK

WATER TREATMENT TECHNOLOGY

Ozone essential for water treatment

In the view of Hydro-Elektrik GmbH, it is impossible to manage without ozone when it comes to water treatment. Due to its wide-ranging actions, ozone is used in water treatment for disinfection and for the environmentally friendly oxidation of inorganic and organic matter. In many drinking water plants, an ozone stage is one of the central treatment stages.

Experts are aware that under certain conditions, ozonisation can also produce small quantities of unwanted reaction byproducts. The aim of all water treatment is of course to produce drinking water that is of the optimum quality for the consumer and to minimise the unwanted substances content.

Hydro-Elektrik GmbH, and indeed other plant constructors, regard the recently announced findings relating to the possible formation of the nitrosamine N-nitroso dimethylamine (NDMA) as a challenge to improve upon tried-and-tested treatment processes.

NDMA can be produced during the ozonisation of water containing N,N dimethylsulfamide (DMSA). DMSA is a metabolite of the active agent tolylfluanide that is produced with agents used to treat plants (fungicides). According to the assessment of the Federal Environment Agency (Umweltbundesamt), there are no long-term health risks associated with the consumption over a lifetime of drinking water containing maximum levels of 0.01 micrograms / l of NDMA and 1 microgram / l of DMSA.

Compact drinking water plants (TWK) for water treatment with ozone

Initial wide-ranging tests indicate that the newly defined maximum levels have only been exceeded in individual water treatment plants under very specific conditions, and that there is an absolute need for action.

Hydro-Elektrik GmbH points out that in the event of possible problem cases, there should be no hasty interventions in the process technology, because additional, previously unknown decomposition products can be produced if other oxidizing agents are used in the oxidation of DMSA.

Possible approaches for reducing the reaction byproducts exist, for example, in a reduction of the ozone dosage, the reaction time and in optimizing the downstream, biologically acting filter stage. In any case however, the experience of an experienced plant constructor should be incorporated into possible plant modifications.

NEWS & TRENDS

PLASMA CUTTING SYSTEM GOES INTO OPERATION

In order to be able to supply more quickly, flexibly and economically, Hydro-Elektrik GmbH took the decision to purchase a plasma cutting system for the new hall in Tannheim.

Transport cost savings are also expected, which will also make the system an ecologically sound investment.

The investment total is around 200,000 Euros.

BØ KOMMUNE - TELEMARK IN NORWAY

Groundwater - with a low pH value, too high content of carbon dioxide iron and above all manganese - will be the main type of water treated at the new waterworks in the Norwegian commune Bø to produce excellent drinking water.

Following pre-aeration to reduce the carbon dioxide content, the water will be oxidised with oxygen and filtered via calcium carbonate. The system, which has three filters, has been operational since October 2007. The plant's treatment capacity is up to 300 m³/h.

Water treatment in Bø Kommune

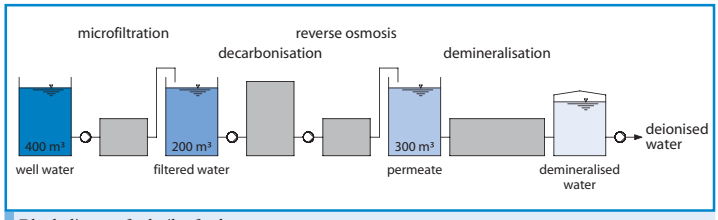
PERSONAL NEWS

INDUSTRY

RWT provides water treatment for a combined heating and power station

For its new combined heating and power station in Duisburg-Walsum, the international energy company Evonik-Steag has placed its trust in the superb competence of RWT GmbH in the field of supplementary water treatment. The energy supplier has selected RWT to provide water treatment systems for the new Block 10, which can generate 790 MW of electrical power.

The impressive standard and extraordinarily high operating safety of RWT systems finally convinced the power station operator to entrust RWT-GmbH with responsibility for this important project. The new water treatment for the boiler water feed supply is of a multi-stage design. Pretreatment of the raw water (well water) using membrane technologies (microfiltration) is followed by decarbonisation via weakly acidic cation exchangers with a capacity of up to 50 t/h. Downstream of the decarbonisation is a reverse osmosis system and a demineralisation system for approximately 36 t/h with cation and anion exchangers employing combined suspension technology. Fine purification is done with a mixed bed ion exchanger. The scope of supply also includes the necessary secondary systems such as chemicals storage, dosing, regeneration stations and neutralisations.



Block diagram for boiler feed water treatment

RWT GmbH is already involved in the planning, and is responsible for the construction, setting up, commissioning and documentation of the water treatment system. RWT is collaborating with a consortium partner with regard to the membrane technologies. The total order value will amount to approximately 1,600,000 Euros.

Commissioning of the system is planned for 2008, and that of the whole power station is scheduled for 2009/2010. (Further information is available from Mr. Stuckwisch or at www.myrwt.de).

RAPID DECARBONISATION

Central drinking water softening

A hard water supply - hardness range 3-4 (2.5 to 4 mmol/l) - can be very disadvantageous to the consumer. Known problems include limescale deposits and greater power and detergent consumption. These are in addition to the relatively high operating costs of decentralised water softening.

The water treatment specialists of the Hydro-Elektrik GmbH group now also offer systems for centralised water softening - in cooperation with the engineering office Alwin Eppler GmbH & Co KG in Dornstetten. The main emphasis here is in the field of drinking water treatment. Various processes are employed in drinking water softening, the respective advantages of which also depend to a significant degree on the water flow rate.

Reactor tank

One of the most economical and operationally safe processes is rapid decarbonisation using sodium hydroxide dosing, which was developed by Dr. Graveland in Holland and has proved successful over a period of several decades.

The precise, regulated addition of sodium hydroxide in an up-current reactor containing coarse sand results in a strong disturbance of the lime / carbon dioxide balance in the water and thereby in crystallizing-out of the lime on the surface of the coarse sand grains that function as crystallisation cells.

Rapid decarbonisation allows a massive reduction in water hardness.

A rapid decarbonisation system of this type was installed in the Rotherst water works in Achern at the beginning of September. The reactor, which measures 2,300 mm in diameter and 10,000 mm in height, is designed for a flow capacity of 60 to maximum 100 l/s and enables water hardness to be halved from around 4 to 2 mmol/l.

The system is fed with hard groundwater from three wells, and can cover a daily requirement of 3500 to 7000 m³.

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