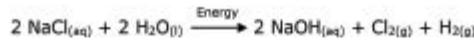


Since 1892, chlorine has been produced on an industrial scale using the chlor-alkali process. The name 'chlor-alkali' refers to the two products made in the process – chlorine and sodium hydroxide (an alkali). The Klorigen™ technology brings this process to end-users, allowing them to generate their own chlorine, on-site and on-demand. To begin, potable water is softened and combined with evaporated salt to produce a saturated brine solution. The brine solution is added to the anode compartment which is separated by an ion selective membrane from the cathode compartment (containing water). A DC electromotive force field is applied, which breaks apart the salt and water and

allows the positive sodium and hydrogen ions to pass through the membrane to the cathode compartment. The hydroxide ions formed on the cathode side will react with incoming sodium ions to form sodium hydroxide (NaOH). Chlorine gas is produced at the anode and diffuses to the top of the cell for removal:



Air, provided by a blower, dilutes the hydrogen concentration below the Lower Explosive Limit (LEL) prior to venting to the atmosphere. Daily production capacities of the systems range from 20 kg to upwards of 20 tons of chlorine per day.

According to the **Essential Chemistry Industry**, approximately 56 million tons of chlorine are produced annually throughout the world; chlorine is an essential element in the manufacture of many everyday products and in water and wastewater treatment. Sodium hypochlorite is another chemical preferred for large-scale water treatment with applications across a variety of other industries. ■

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يتم استخدام غاز الكلور وهيبوكلوريت الصوديوم ( "الكلور السائل" أو "التبييض" ) على نطاق واسع في جميع أنحاء الولايات المتحدة وحول العالم لتعقيم المياه ومعالجة مياه الصرف الصحي. وبينما ينمو الطلب على هذه المواد الكيميائية، ترتفع أيضاً نسبة مخاطر التخزين وحوادث النقل. ونتيجة لذلك، يمانع اليوم القِيمون على المرافق ومستخدمو المواد الكيميائية بشكل متزايد مناولة غاز الكلور وتخزينه. ووفقاً لمركز التقدم الأمريكي، تحوّلت 500 محطة من محطات المياه والصرف الصحي نحو بدائل أكثر أماناً في عام 2010. وطوّرت شركة إيليكتروليتيك تكنولوجيز ش.م.م (Electrolytic Technologies LLC) تقنية كلوريجين (Klorigen™) لمعالجة هذه القضايا، وتوفر لمستخدمي المواد الكيميائية المعدات التي يمكن أن تنتج غاز الكلور وهيبوكلوريت الصوديوم مركزياً، وبناء على الطلب، وبالتالي التخلص من الحاجة إلى نقل هذه المواد الكيميائية ومعالجتها وتخزينها. يُستخدم غاز الكلور في تصنيع مواد التنظيف، وتركيب الأدوية والمواد البلاستيكية، ومعالجة مياه المسابح، ويعتمد أيضاً في التطبيقات التعدينية وفي توفير مياه صالحة للشرب.

## AIS Could Have Prevented 'Green' Pool Debacle in Rio

Australian made and manufactured water disinfection technology could have prevented the Rio 2016 Olympics organizers from being left red-faced by the green, foul-smelling pool water that forced the temporary closure and draining of an Olympic diving pool and



Elena Gosse, CEO of AIS

severely disrupted athletes' training. Elena Gosse, the CEO of **Australian Innovative Systems (AIS)**, a Brisbane-based manufacturer of chlorine generators for water disinfection, said that an automatic, in-line Chlorine generator like the ones AIS produces could have ensured the Rio pool water stayed clean and clear and saved the organizers from embarrassment. "The bright green water was due to the presence of large amounts of green algae which is a symptom of inadequate disinfection and not enough Chlorine. If Chlorine levels were initially properly maintained the situation would not have happened as the algae could not have grown." Pool management in Rio has publicly stated that incorrect chemicals were used in the pool diminishing the ability of the Chlorine to do its job of keeping the water clean and clear. "While Olympic officials originally closed

the pool and tried shock-dosing the water, unfortunately the wrong chemical was used which then effectively destroyed all of the Chlorine. The only option then left was to drain millions of liters of water from the pool," Elena said. The multi-award winning CEO said it was unfortunate that a number of 'no chlorine' claiming technologies were emerging in the market, many of which were not officially recognized by industry or delivered the adequate disinfection levels required to protect swimmers. "While people have mistakenly held Chlorine responsible for symptoms such as red and irritated eyes, a pungent chemical smell and itchy skin, the problem is not Chlorine but rather chloramines, caused by inadequate levels of Chlorine in the pool," Elena said. "Chlorine remains the only widely-approved, residual disinfectant for public swimming pools world-wide." ■