



Safe Handling of Sodium Chlorate



PAPTAC

Bleaching Committee– Fall 2016



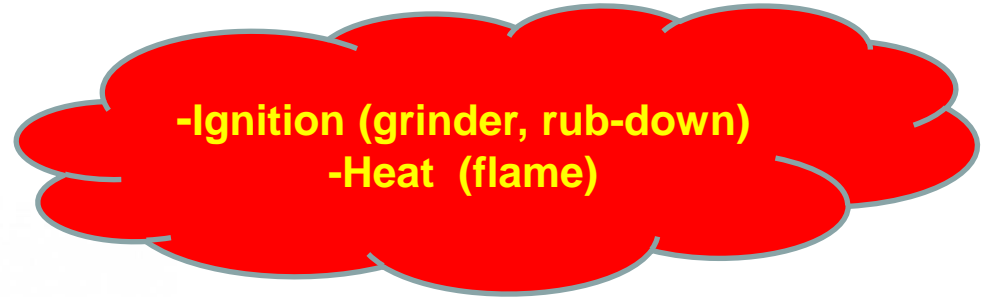
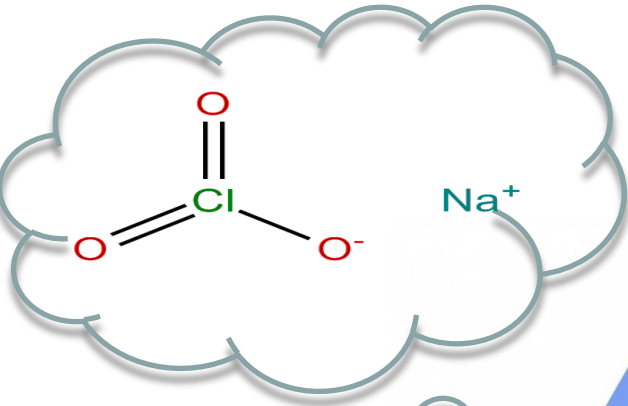
Presented by

Stéphane Messier, ing. MBA

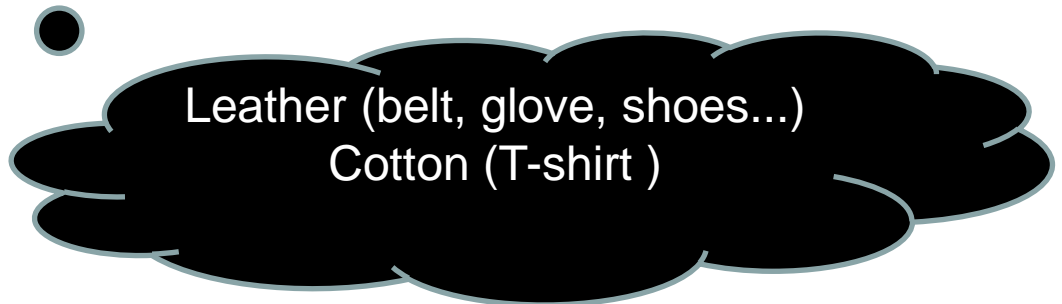
Responsible Care®
Our commitment to sustainability.



Why a sodium chlorate safety seminar?



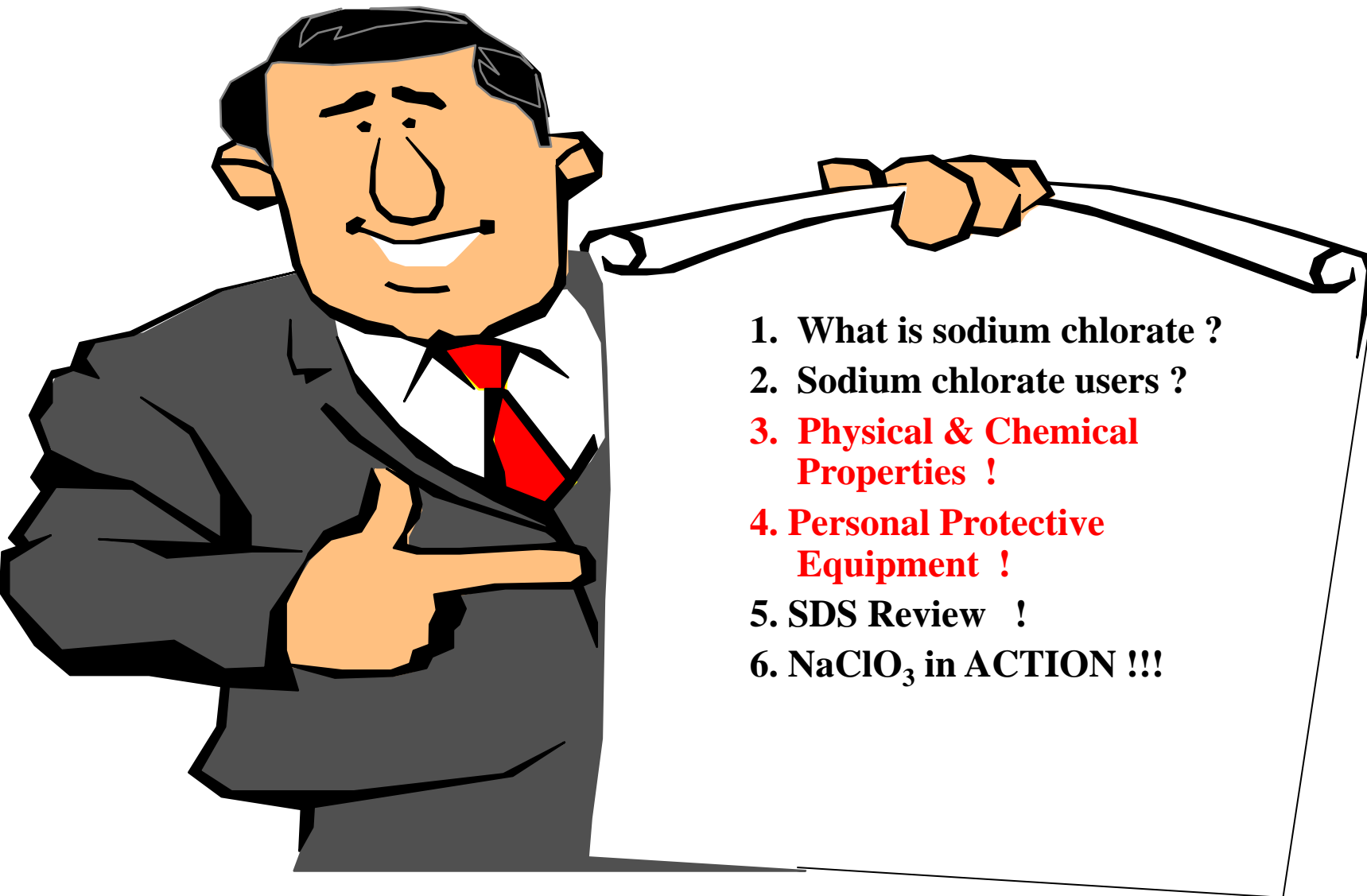
-Ignition (grinder, rub-down)
-Heat (flame)



Leather (belt, glove, shoes...)
Cotton (T-shirt)

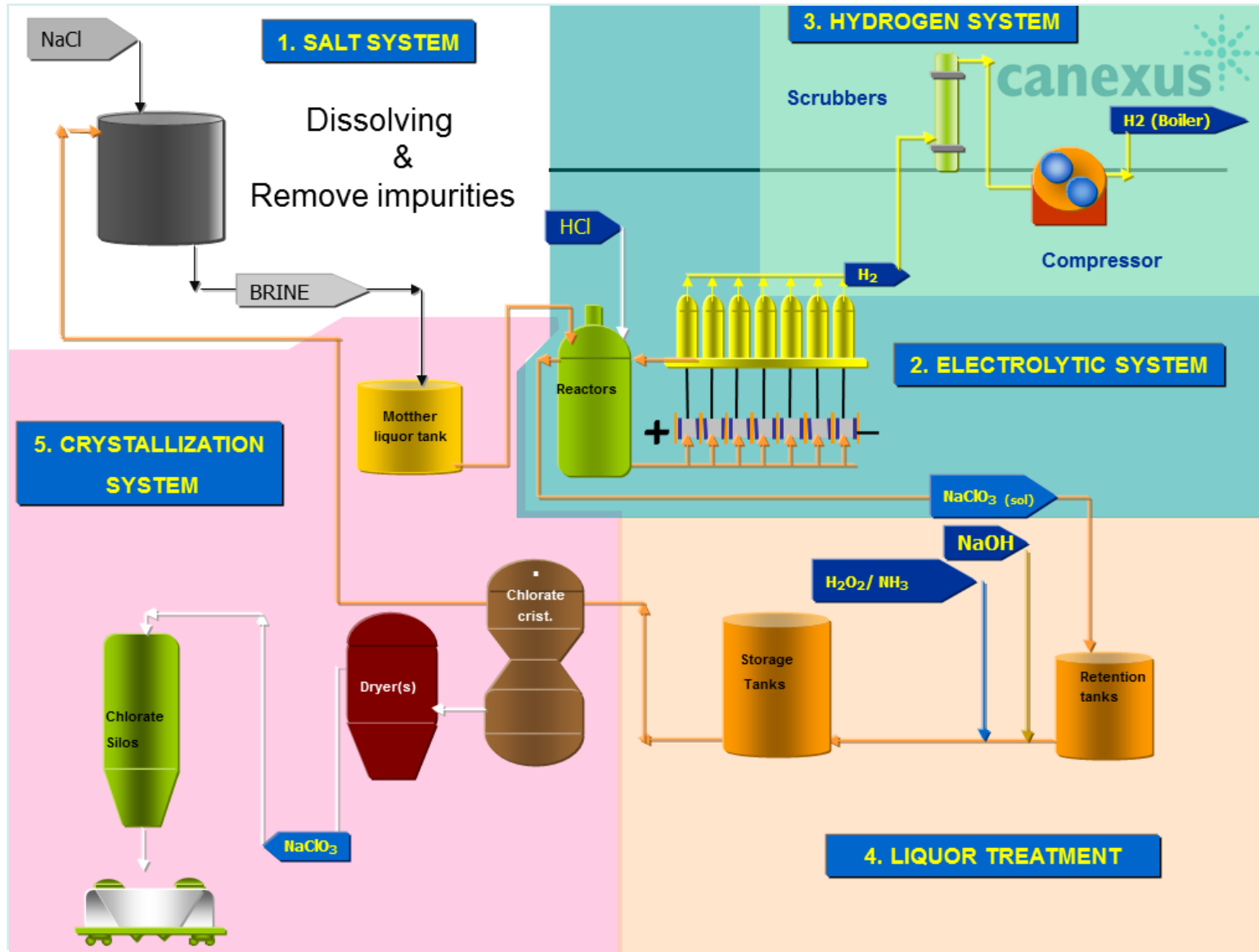
PRODUCT SAFETY SEMINAR

SODIUM CHLORATE



1. What is sodium chlorate ?
2. Sodium chlorate users ?
3. **Physical & Chemical Properties !**
4. **Personal Protective Equipment !**
5. SDS Review !
6. NaClO₃ in ACTION !!!

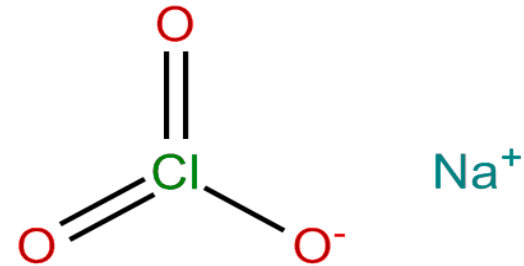
What is Sodium chlorate?



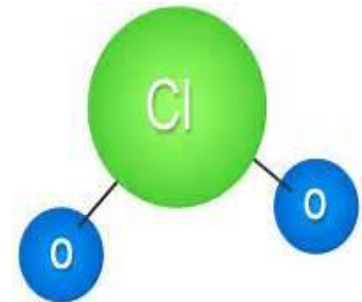
PRODUCT SAFETY SEMINAR

SODIUM CHLORATE

- **Sodium chlorate users**



- Majority (>95%) of the production is used in pulp and paper industry for chlorine dioxide generation
- Other application include
 - Agriculture (herbicides and defoliants)
 - Mining (vanadium and uranium)
 - Chemical synthesis (rocket propellants and dyes)
 - Shale gas



PRODUCT SAFETY SEMINAR

SODIUM CHLORATE

Physical & Chemical Properties

- **General**

- **Chemical formula:** NaClO_3
- **Appearance:** White crystalline solid
- **Odor:** Odorless
- **Density:** Solid is 2.5 times as heavy as water



PRODUCT SAFETY SEMINAR

SODIUM CHLORATE



Physical & Chemical Properties

• General

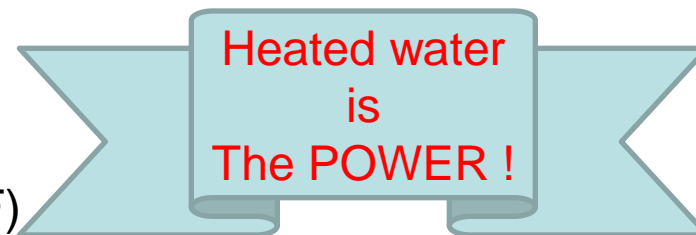
- **pH:** Neutral (solution in water)

- **Solubility:** Soluble in water

-79 g/100 ml or 2.8 oz/ 0.21 pt (0 °C=32 F)

-101 g/100 ml or 3.6 oz/ 0.21 pt (20 °C = 68F)

- 230 g/100 ml or 8.1oz/0.21 pt (100°C= 212 F)



- **QUIZ:** $H_2O + NaClO_3$ then a) temp.  b) temp.  c) temp. 

Answer: Endothermic reaction;
Temperature decreased

PRODUCT SAFETY SEMINAR

SODIUM CHLORATE

Physical & Chemical Properties

- **Reactivity**

- Stable under normal temperature condition
- Decomposes at 265 C (509F) into Oxygen and salt.
- Reacts with acids to produce chlorine, chlorine dioxide



- Reacts violently with **sulfuric acid**.
- Mixture of dry sodium chlorate with organic materials such as **cloth, leather, oil, greases**, may be readily ignited by heat or **friction**.



PRODUCT SAFETY SEMINAR

SODIUM CHLORATE

-True story -



This worker suffered burns as shown when a **flash fire** occurred as he **began welding**. His leather gloves had become contaminated with sodium chlorate solution and became **extremely combustible when the gloves dried**.



PRODUCT SAFETY SEMINAR

SODIUM CHLORATE

In case of fire???

Only water can put out chlorate fires

Never smother with blanket or chemical extinguisher

Drench with water immediately (fire propagation is rapid)

A)



B)



WHY ??

PRODUCT SAFETY SEMINAR

SODIUM CHLORATE

Personal Protective Equipment (PPE)

- High Exposure (e.g. Chemical Unloading)



PRODUCT SAFETY SEMINAR

SODIUM CHLORATE

Personal Protective Equipment (PPE)

- **General Practice**

- Remove contaminated clothing and immediately rinse
- Shower with soap & water after each shift
- Keep work and street clothes separate
- Be cautious of leather clothing (e.g. belts, watch bands, gloves)



PRODUCT SAFETY SEMINAR

SODIUM CHLORATE

SDS Review



- **Skin Irritant.**

- **Mild Irritant** (may irritate eyes and skin)
- Safety showers and eyewash fountains should be provided in strategic locations to permit easy access.

First Aid



- Flush eyes and skin with water for at least 15 minutes.
- Remove contaminated clothing and rinse immediately.
- Get medical attention (**do not apply oils, greases** or skin creams – can cause flammable mixture).

PRODUCT SAFETY SEMINAR

SODIUM CHLORATE



SDS Review

- **Inhalation.**

- **Irritant** (dust may irritate respiratory tract and mucous membranes).
- Proper ventilation will minimize exposure.
- Workers should wear particulate respirators in areas where high concentration of dust may exist.

First Aid



- Remove victim to fresh air. Give artificial respiration or oxygen if breathing becomes difficult.
- Seek medical attention.

PRODUCT SAFETY SEMINAR

SODIUM CHLORATE



SDS Review

- **Ingestion.**

- **Swallowing** sodium chlorate is dangerous and may be fatal.
- Workers should not eat or drink in the sodium chlorate area. After handling chlorate wash thoroughly before eating.

First Aid

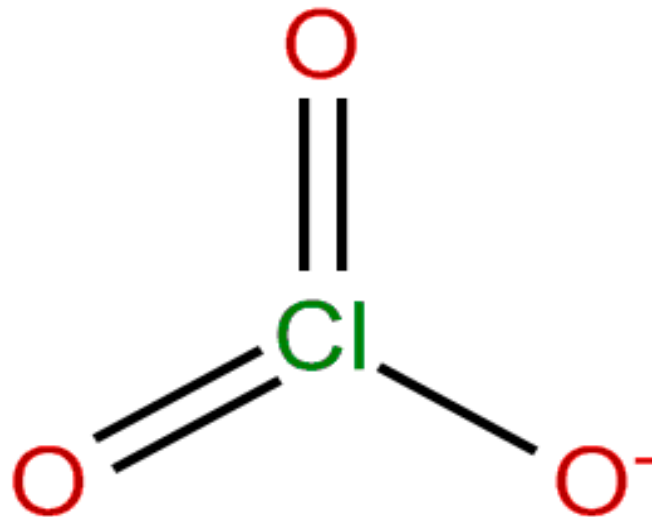


- Seek medical attention immediately.

PRODUCT SAFETY SEMINAR

SODIUM CHLORATE

NaClO₃ Movie TIME





IMPORTANT: The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our knowledge. No warranty or guarantee, expressed or implied, is made regarding performance, stability or otherwise. This information is not intended to be all-inclusive as the manner and conditions of use, handling, storage and other factors may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended as, and nothing shall be construed as, a recommendation to infringe any existing patents or to violate any Federal, State, Provincial and local laws.

