From bleach (هيبو كلورات الصوديوم)
PLASTIC EXPLOSIVE FROM SWIMMING POOL (هيبو كلورات الكالسيوم) H.T.H
PLASTIQUE EXPLOSIVE FROM TABLE SALT NaCl(Table) and Kcl
Another way of making Sodium Chlorate from Table salt.

CHAPTER 4 - PLASTIQUE EXPLOSIVE FROM BLEACH

This explosive is a potassium chlorate explosive. This explosive and explosives of similar composition were used in World WarI as the main explosive filler in grenades, land mines, and mortar rounds used by French, German and some other forces involved in that conflict. These explosives are relatively safe to manufacture. One should strive to make sure these explosives are free of sulfur, sulfides, and picric acid. The presence of these compounds result in mixtures that
are or can become highly sensitive and possibly decompose explosively while in storage. The manufacture of this explosive from bleach is given just as an expedient method. This method of manufacturing potassium chlorate is not economical due to the amount of energy used to boil the solution and cause the 'dissociation' reaction to take place. This procedure does work and yields a relatively pure and a sulfur, sulfide free product. These explosives are very cap sensitive and require only a #3 cap for instigating detonation. To manufacture potassium chlorate from bleach (5.25% sodium hypochlorite solution) (NaOCl), .

Dissociation (chemistry),

breaking up of compounds into simpler forms through a reversible reaction, especially under the influence of heat and of pressure. See Chemical Reaction.

Material Needed:

1) heat source (hot plate, stove etc.)
2) a battery hydrometer,
3) a large pyrex or enameled steel container, (to weigh chemicals),
4) and some potassium chloride (sold as salt substitute).

Making Procedure

- Take one gallon of bleach (3.785 liters,) and place it in the container and begin heating it.
- While this solution heats, weigh-out 63 G. potassium chloride(KCl) and add this to the bleach being heated.
- Bring this solution to a boil and boil until when checked with a hydrometer, the reading is 1.3 (if a battery hydromcter is used it should read full charge).
- When the reading is 1.3, take the solution and let it cool in the refrigerator until it is between room temperature and 0 deg. C..
- Filter out the crystals that have formed and save them.
- Boil the solution again until it reads 1.3 on the hydrometcr
- and again cool the solution. Filter out the crystals that are formed and save them.
- Boil this solution again and cool as before.
- Filter and save the crystals.

The proccss of purification is called fractional crystalization.

- Take these crystals that have been saved and mix them with distilled water in the following proportions: 56 G. per 100 ml. distilled water.
- Heat this solution until it boils and allow it to cool.
- Filter the solution and save the crystals that form upon cooling.

These crystals should be relatively pure potassium chlorate.

Making a mixture:

- Powder these to the consistancy of face powder (400 mesh) ...(look at $KCLO_3$ MIXTURES)
- and heat gently to drive off all moisture.
- Melt five parts vaseline and five parts wax.
- Dissolve this in white gasoline (camp stove gasoline).
- and pour this liquid on 90 parts potassium chlorate (the crystals from the above operation) in a plastic bowl.
- Knead this liquid into the potassium chlorate until imtimately mixed. Allow all the gasoline to evaporate.
- Place this explosive in a cool dry place. Avoid friction and sulfur, sulfides and phosphorous compounds.

Molding :

- This explosive is best molded to the desired shape and density (1.3 g./cc) and dipped in wax to water proof.

These block type charges guarantee the highest detonation velocity. This explosive is really not suited to use in shaped charge applications due to its relatively low detonation velocity. It is comparable to

40% ammonia dynamite and can be considered the same for the sake of charge computation. If the potassium chlorate is bought and not made, it is put into the manufacture process in the powdering stages powerful. The addition of 2 - 3 % aluminum powder increases its blast preceding the addition of the wax-vaseline mixture. This explosive is bristant and effect. Detonation velocity is 3300 M/sec.

PLASTIC EXPLOSIVE FROM SWIMMING POOL CLORINATING COMPOUND (H.T.H.)

This explosive is a chlorate explosive from bleach. This method of production of potassium or sodium chlorate is easier and yields a more pure product than does the plastique explosive from bleach process.

Summary:

In this reaction the H.T. H. (calcium hypo-chlorate - **$Ca[OCl]_2$)** is mixed with water and heated with either sodim chloride **(Na Cl)** (table salt, rock salt) or potassium chloride **(KCl)** (salt substitute). The latter of these salts is the salt of choice due to the easy crystalization of the potassium chlorate. This mixture will need to be boiled to ensure complete reaction of thc ingredients.

Process:

- Obtain some H.T.H. swimming pool chlorination compound or equivalent (usually 65% calcium hypochlorite). As with the bleach is also a dissociation reaction.
- In a large pyrex glass or enameled steel container place 1200 g. H.T.H. and 220 G. potassium chloride or159 g. sodium chloride.

- Add enough boiling water to dissolve the powder and boil this solution. A chalky substance (calcium chloride) will be formed.
- When the formation of this chalky substance is no longer formed, the solution is filtered while boiling hot.
- If potassium chloride was used, potassium chlorate will be formed. This potassium chlorate will drop out or crystalize as the clear liquid left after filtering cools.
- These crystals are filtered out when the solution reaches room temperature.
- If the sodium chloride salt was used this clear filtrate (clear liquid after filtration) will need to have all water evaporated. This will leave crystals which should be saved.

These crystals should be heated in a slightly warm oven in a pyrex dish to drive off all traces of water (40 - 75 deg.C.). These crystals are ground to a very fine powder (400 mesh). If the sodium chloride salt is used in the initial step, the crystallization is much more time consuming. The potassium chloride is the salt to use as the resulting product will crystallize out of solution as it cools. If sodium chloride is used in this explosive, it will have a tendancy to cake.

Follow previous Mixture steps.

Mixtre sample:

Potassium or sodium chlorate	90 %
Vaseline	10 %

The detonation velocity can be raised to a slight extent by the addition of 2 - 3 % aluminum powder substituted for 2 - 3 % of the vaseline. The addition of this aluminum will give this explosive a bright flash if set off at night which will ruin night vision for a short while. The detonation velocity of this explosive is approximately 32OO M/sec. for the potassium salt and 290O M/sec. for the sodium salt based explosive.

PLASTIQUE EXPLOSIVE FROM <u>TABLE SALT</u>

2 other files

Intro:

This explosive is perhaps <u>the most easily</u> manufactured of the <u>chlorate based explosives</u>. because Sodium chlorate is the product <u>rock salt</u> is the major starting ingredient. This process would *work equally as if potassium chlorate were used instead of the sodium chloride (rock salt)*. The sodium chlorate is the salt I will cover due to the relatively simple acquisition of the main ingredient. The resulting explosive made from this process would serve as a good cheap blasting explosive and will compare favorably with *30 % straight dynamite* in power and blasting efficiency. These explosives and similar compositions were used to some extent in World War I by European forces engaged in conflict. <u>It was used as a grenade and land mine filler.</u>

Its only drawback is :

1) Its hygroscopic nature (tendency to absorb atmospheric moisture).
2) These explosives also have a relatively critical loading density. These should be used at a **<u>loading density of 1.3 g./cc.</u>** If the density is not maintained, unreliable or incomplete detonation will take place.
These shortcomings are easiiy overcome by (1) coating the finished explosive products with molten wax and (2) loading this explosive to the proper density. <u>This explosive is **not good for shaped charge** use due to it's low detonation rate (2900 M/sec.).</u>

Process,Intro:

The major part : of the manufacture of this explosive from rock salt is the ***cell rcaction*** where D.C current changes the sodium chloride to chlorate by adding oxygen by electrolysis of a saturated brine solution.

The reaction takes place as follows:

$$NaCl + 3\ H_2O \rightarrow NaClO_3 + 3\ H_2$$

In this reaction the sodium chloride (NaCl) takes the water's oxygen and releases its *hydrogen as a gas*. This explosive gas *must be vented a ways as sparks or open flame may very well cause a tremendous explosion*. This type of process or reaction is called a **'cell' reaction**.

Cell Reactor(Electrolysis Device)

The cell should be constructed of *concrete or stainless steel*. I won't give any definite sizes on the cell's construction because the size is relative to the power source.

This cell would have to be large enough to allow the brine to circulate throughout the cell to insure as uniform a temperature as possible. The speed of the reaction depends on two variables.

1) Current density is a very important factor in the speed of the reaction. *The advantages of high current* densities are a

A) faster and more efficient reaction. The disadvantages are that cooling is needed to carry away excess heat and the more powerful power sources are very expensive.

For small operations, a battery charger can be used (automotive).

This is the example I will use to explain the cell's setup and operation *(10 amp /12 volt)*. The current density at the anode (+) and cathode (-) are critical. This density should be (50 amps per square foot) at the cathode and (30 amps per square foot at the anode). For a 10 amp battery charger power source, this would figure out to be 5 5/16" by 5 5/16" for the cathode. The anode would be 6 15/16" by 6 5/16". The anode is made of **graphite** or pressed **charcoal** and the **cathode** is made of **steel plate (1/4")**. These would need to be spaced relatively close together. This spacing is done with some type of non-conducting material such as glass rods. This spacing can be used to control the temperature to some extent. The closer together they are, the higher the temperature. These can be placed either horizontally or vertically although vertical placement of the anode and cathode would probably be the ideal set up as it would allow the hydrogen to escape more readily. The anode would be placed at the bottom if placed horizontally in the cell so that the chlorine released could readily mix with the sodium hydroxide formed at the cathode above it. As the current passes through, the cell **chlorine is released at the anode** and mixes with the **sodium hydroxide(OH)** formed at the cathode. Hydrogen is released at the cathode which should bubble out of the brine. This gas is explosive when mixed with air and proper precautions should be taken. PROPER VENTILATION MUST BE USED WITH THIS OPERATION TO AVOID EXPLOSION.

Temperature control

is left up to the builder of the cell The temperature of the cell should be maintaincd **at 56. degrees C.** during the reaction**.(1)** This can be done by the circulation of water through the cell in pipes.

(2) But the easiest way would be to get an adjustable thermostatic switch adjusted to shut the power source off until the cell cools off. This temperature range could be from 59 degree shut off to a 53 degree start up. An **hour meter** would be used on the power source to **measure the amount of time the current passes through the cell**. If the water- cooling coil design appeals to the manufacturer and an easily obtained cheap source of cool or cold water is available, this would be the quickest design to use. Again a thermostatic type arrangement would be used to meter the cold cooling water through the cell. The cooling coils would best be made of stainless steel to overcome the corrosiveness of the salts although this is not entirely necessary. A thermostatic valve would be set to open when the brine electrolyte was heated above approximately 58 deg C. and set to close when the temperature fell to approximately 54 deg C.. Again this would be the best and most efficient method and the waste heat could be used relatively easily to heat either a house or perhaps even a barn or shop.

To run the cell, after the cell has been constructed and the concrete has been sealed and has set and cured for several weeks, is very simple. First, to seal the concrete I suggest Cactus Paint's CP200 series, two component epoxy paint or an equivalent product. To fill the cell,

Procedure:

Place (1) **454 g. sodium chloride** in the cell (rock salt is excellent here). (2) Place **four liters of distilled water** into the cell with the salt. The liquid should cover the anode and the cathode completely with room to spare. Remember that some of the water will be used in the reaction.

Thirty three grams of (3) **muratic acid**[1], which should be available from a swimming pool supply store is then added to the liquid in the cell. Be careful when handling any acid !!! Then (4) seven grams of **sodium dichromate** and (5) **nine grams of barium chloride** is added. The cell is then ready to run if the plates are connected to their respective cables. These **cables** are best made of **stainless steel** (the most corrosion resistant available).

The power supply power is best hooked up remotely to lessen the chance of is then hooked up and the cell is in operation. The explosion. Any time the cell runs it will be making hydrogen gas.

Warning:

THIS GAS IS EXPLOSIVE WHEN MIXED WITH AIR AND ALL SPARKS, FLAME, AND ANY SOURCE OF IGNITION SHOULD BE KEPT WELL AWAY FROM THE CELL. THIS CELL SHOULD ONLY BE RUN WITH; VERY GOOD VENTILATION. The steel plate cathode should be hooked to the negative side of the power source and the anode hooked to the positive side. Again these are hooked to the power supply via stainless steel cables. This cell is then run at the proper temperature until **1800** amp hours pass through (amount per pound of sodium chloride) the electrolyte.

The liquid in the cell is then removed and placed in an enameled steel container and boiled until crystals form on liquid. It is cooled and filtered, the crystals collected being saved. This is done twice and the remaining liquid saved for the next cell run. The process will become easier as each run is made. It is a good idea to keep records on yields and varying methods to find out exactly the best yield process.

Purification:

[1] Try Battery water (diluted H_2SO_4) as in other experiment

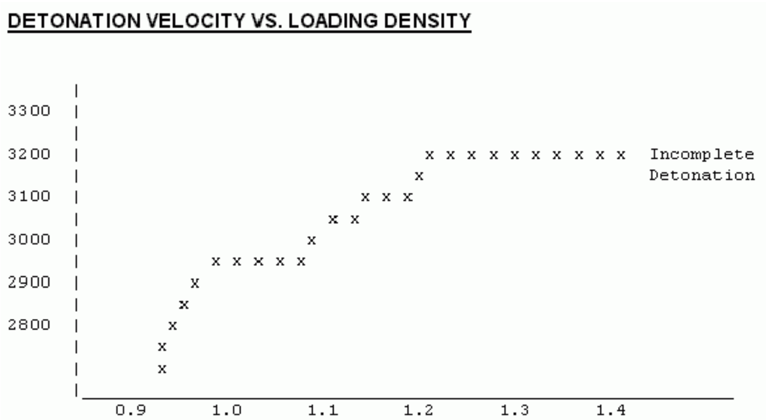
To purify these crystals place 200 grams in 100 ml and distilled water. Boil the solution until crystals are seen on the surface. Let cool and filter as before. Save this liquid for the next cell run. These purified crystals are placed in a pyrex dish and placed in the oven at 50 deg C. for two hours to drive off all remaining water. The explosive is ready to be made. The crystals of sodium chlorate are ground to a powder of face powder consistancy. Ninety grams of this sodium chlorate are kneaded with 10 grams of vaseline until a uniform mixture is obtained. This explosive is sensitive to shock, friction, and heat. These should be avoided at all cost.

Loading Density:

This explosive works best at a loading density of **1.3-1.4 g./cc**. If this explosive is not used at this density, the detonation velocity will be low and detonation will be incomplete.

Measuring density:

To load to a known density measure the volume of the container in which the explosive is to be loaded. This can be done by pouring water out of a graduated cylinder until the container is filled. The total number of ml will equal the cc's of the container. Multiply this number times 1.3 and load that much explosive (in grams of course) into the container after the container has been dryed of all water. This procedure should be used with all chlorate explosives (plastique explosive from bleach, plastique explosive from H.T. H.). This explosive is cheap and relatively powerful and is a good explosive.



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Sodium Chlorate

Sodium Chlorate is a strong oxidizer used in the manufacture of explosives. It can be used in place of Potassium Chlorate.

Material Required	Sources
carbon or lead rods by 5 in. long) (1 in. 2 diameter	Dry Cell Batteries (2-1/2 in. diameter by 7" long) or plumbing
Salt, or ocean water	Grocery store or ocean
Sulfuric acid, diluted water Motor Vehicle	Motor Vehicle Batteries

Material Required
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2 wires, 16 gauge (3/64 in. diameter approx.), 6 ft. long, insulated.
Gasoline

1 gallon glass jar, wide mouth (5 in. diameter by 6 in. high approx.)
Sticks
String
Teaspoon
Trays
Cup
Heavy cloth
Knife
Large flat pan or tray

Procedure :

1) Mix 1/2 cup of salt into the one gallon glass jar with 3 litres (3 quarts) of water.
2) Add 2 teaspoons of battery acid to the solution and stir vigorously for 5 minutes.
3) Strip about 4 inches of insulation from both ends of the two wires.
4) With knife and sticks, shape 2 strips of wood 1 by 1/8 by 1-1/2. Tie
the wood strips to the lead or carbon rods so that they are 1-1/2 inches apart.
5) Connect the rods to the battery in a motor vehicle with the insulated
wire.
6) Submerge 4-1/2 inches of the rods in the salt water solution.
7) With gear in neutral position, start the vehicle engine. Depress the accelerator approx. 1/5 of its full travel.
8) Run the engine with the accelerator in this position for 2 hours, then
shut it down for 2 hours.
9) Repeat this cycle for a total of 64 hours while maintaining the level
of the acid-salt water solution in the glass jar.
CAUTION: *This arrangement employs voltages which can be quite dangerous! Do not touch bare wire leads while engine is running!!*
10) Shut off the engine. Remove the rods from the glass jar and disconnect wire leads from the battery.

11) Filter the solution through the heavy cloth into a flat pan or tray,
leaving the sediment at the bottom of the glass jar.
12) Allow the water in the filtered solution to evaporate at room temperature (approx. 16 hours). The residue is approximately 60% or more sodium chlorate which is pure enough to be used as an explosive>
see preparing Chlorate for use in mixtures.

متفجرات الكلورات

تحضير الكلورات المواد المطلوبة: هيبوكلورات الصوديوم (الكلوركس) كلوريد البوتاسيوم (متوفر في محلات تجهيز المختبرات وفي الصيدليات كملح بديل لمرضى الضغط). الطريقة:

1- **خذ 1 لتر من الكلوركس (تركيز 4% وإذا كان التركيز أكثر فيجب أخذ كمية معادلة مثلا لو كان التركيز 6.5% فالكمية المكافئة هي 690 ملل) وضعها في اناء زجاجي على نار هادئة حتى الغليان.**
2- **اتركها تغلي على نار هادئة وتتبخر حتى يبقى ما حجمه حوالي 140 ملل (ليس بالضرورة أن يكون الحجم دقيقا جدا يعني يزيد أو ينقص 10 ملل لا يؤثر).**
3- **اترك المحلول يبرد لدرجة حرارة الغرفة (20-25) درجة واذا لاحظت تكون راسب في هذه المرحلة فقم بترشيح المحلول باستخدام قمع وقطعة قماش بيضاء أو ورق ترشيح ، تخلص من الراسب (عبارة عن كلوريد صوديوم) واحتفظ بالمحلول.**
4- **في وعاء منفصل قم باذابة 28 غم من كلوريد البوتاسيوم بأقل كمية من الماء (تقريبا 80 ملل) يمكن أن تبدأ ب 70 ملل ثم تزيد الماء**

على دفعات صغيرة 20 مل مثلا حتى تتمكن من اذابة كل كلوريد البوتاسيوم فتوقف عن اضافة الماء.

5- **اضف المحلول الثاني الى المحلول الأول بهدوء ستلاحظ تكون راسب، هذا الراسب هو كلورات البوتاسيوم.**

6- **قم بتسخين المحلول لدرجة الغليان بنار هادئة وبحذر حتى يذوب الراسب (قد يلزم اضافة بعض الماء المهم أن يذوب الراسب بأقل كمية من الماء).**

7- **اترك المحلول يبرد لوحده دون تبريد ستلاحظ تكون الراسب من جديد بعد أن يبرد لدرجة حرارة الغرفة قم بتبريده لدرجة الصفر (يمكن وضعه في الثلاجة).**

8- **رشح المحلول لتحصل على بلورات كلورات البوتاسيوم (كلما كان الترشيح على درجة حرارة أقل كلما حصلت على كمية أكبر من الكلورات) ثم اغسلها بماء مثلج.**

9- **لتنقية الكلورات أكثر يمكن اذابتها وتسخينها لدرجة الغليان من جديد (20 غم في 100 مل تقريبا أو حتى تذوب) ثم تبريدها واعادة ترشيحها وغسلها بماء مثلج فتحصل على كلورات نقية نسبيا.**

10- **المحلول الراشح من الخطوة 8 و 9 يحتوى على كمية من الكلورات فيمكن اعادة تركيزه بالغليان والتبخير واعادة ترشيحه أو يتخلص منه.**

11- **تجفف الكلورات من بقايا الماء بوضعها في فرن درجة حرارته 100 لمدةنصف ساعة أو**

يمكن بالهواء الساخن من مجفف الشعر ولكن بحذر. ملاحظة مهمة: عندما تتكون الكلورات (الخطوة 5) قم بفحص المحلول بورق عباد الشمس لا يجب أن يكون حامضا لأنه يكون خطيرا واذا كان حامضا فأضف عليه قليلا من هيدروكسيد البوتاسيوم حتى يتعادل. اذا أمكنك استخدام ماء مقطر فهو الأفضل.