

Hydrogen Peroxide

Hydrogen Peroxide, chemical compound of hydrogen and oxygen with the formula H_2O_2 . Pure, anhydrous hydrogen peroxide is a colorless, syrupy liquid with a specific gravity of 1.44. It blisters the skin and has a metallic taste. The liquid solidifies at $-0.41^\circ C$ ($31.4^\circ F$). Concentrated solutions are unstable, and the pure liquid may explode violently if heated to a temperature above $100^\circ C$ ($302.4^\circ F$). It is soluble in water in all proportions, and the usual commercial forms are a 3% and a 30% aqueous solution. To retard the decomposition of the peroxide into water and oxygen, organic substances, such as acetanilide, are added to the solutions, and they are kept in dark bottles at low temperature.

Hydrogen peroxide is(1) manufactured in large amounts by the electrolysis of aqueous solutions of sulfuric acid or of potassium bisulfate or ammonium bisulfate. It is also prepared (2) by the action of acid on other peroxides, such as those of sodium and barium.

Hydrogen peroxide acts as both an oxidizing and a reducing agent. Its oxidizing properties are used in the bleaching of substances, such as hair, ivory, feathers, and delicate fabrics, which would be destroyed by other agents. It is also used medicinally, in the form of a 3% aqueous solution, as an antiseptic and throat wash.

Hydrogen peroxide is used in restoring the original colors to paintings that have darkened through the conversion of the white lead used in the paintings to lead sulfide. The hydrogen peroxide oxidizes the black lead sulfide to white lead sulfate. It is also used as a source of oxygen in the fuel mixture for many rockets and torpedoes. As a

reducing agent it reacts only with such easily reduced chemicals as silver oxide and potassium permanganate.

Anthraquinone

[The manufacturing](#) process involves the catalysis of the reaction of H₂ (obtained from processing Maui Gas) with atmospheric O₂ to give H₂O₂. Anthraquinone (Q) is used as a H₂ carrier.

What I really need is a synthesis "black box" of sorts that takes in water and electricity and puts out hydrogen and H₂O₂. I've seen anthraquinone . mentioned as a catalyst

Electrolysis:

Hydrogen from Water

Hydrogen peroxide could be [prepared](#)

- by any one of the following methods:
- a. electrolysis of ammonium sulfate followed by the hydrolysis of persulfate to peroxide;
 - b. oxidation of [secondary alcohol](#) (e.g., isopropanol) to ketone and peroxide;
 - c. cyclic [anthraquinone process](#);
 - d. [oxidation of alkali metals\(Li,Na,K,Rb, Cs.\) to peroxides](#);

Look how

- e. Oxidation of metal to peroxide followed by hydrolysis;
 - f. by cathodic reduction of oxygen to alkaline peroxide solution;
- and
- g. by direct reaction of hydrogen and oxygen over a catalyst.

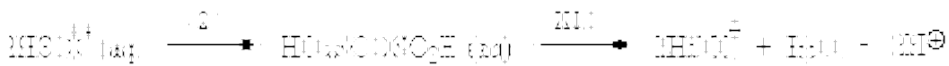
[New process](#) generates hydrogen from aluminum alloy to run engines, fuel cells : Woodall discovered that liquid alloys of aluminum and gallium spontaneously produce hydrogen if mixed with water.

[convert ordinary internal combustion engines to run on hydrogen](#)

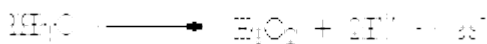
It's a simple matter to convert ordinary internal combustion engines to run on hydrogen. All you have to do is replace the gasoline fuel injector with a hydrogen injector

How does one produce H₂O₂ electrochemically

At high current densities (with the associated safety problems), hydrogen peroxide may be produced by **electrolytic oxidation of acidified sulfate solutions**. The overall reaction is



Notice that the bisulfate is first oxidized to the peroxodisulfate, which hydrolyzes to yield H₂O₂ and regenerate the bisulfate. The net reaction is therefore



Chemistry of the Elements by N.N. Greenwood and A. Earnshaw, Pergamon Press (1984).

<http://www.madsci.org/posts/archives/aug98/903586853.Ch.r.html>

Direct Synthesis of Hydrogen Peroxide from H₂ and O₂ Using Al₂O₃ Supported Au-Pd Catalysts

[http://pubs.acs.org/cgi-](http://pubs.acs.org/cgi-bin/article.cgi/cmaterx/2006/18/i11/html/cm052633o)

[bin/article.cgi/cmaterx/2006/18/i11/html/cm052633o](http://pubs.acs.org/cgi-bin/article.cgi/cmaterx/2006/18/i11/html/cm052633o)

www.chem.leeds.ac.uk/delights/default.htm from power labs look pages ***Ullmann's Encyclopedia of Industrial Chemistry Hydrogen peroxide***

How to synthesize Hydrogen Peroxide.

<http://www.mrw.interscience.wiley.com/emrw/9783527306732/home>

<http://www.wiley-vch.de/vch/software/ullmann/index.php?>

Ullmann's home page

Why don't we [use Oxygen directly for explosion](#) .

References needed :

- 1) Encyclopedia of industrial Chemistry .
- 2) Starkey Chemical Process.
- 3) Kirk-Othmer's Encyclopedia of Chemical Technology or other process papers

prepared by SRI International (Stanford Research Institute).

4) *Chemistry of the Elements* by N.N. Greenwood and A. Earnshaw, Pergamon Press (1984).

Hydrogen Peroxide stabilizers. chelants and sequestrants which minimize its decomposition under normal storage

How was it produced.

1) since the 1880's, it was produced in the U.K. by **burning barium salts** to produce barium peroxide which, when dissolved into water, yields H_2O_2

2) From the 1920's through the 1950's the primary production route was **electrolytic**, which produced a higher purity, higher strength grade.

oxidation of alkali metals to peroxides: Look how metal to peroxide followed by hydrolysis

How to get alkalai metals such as Na, K Potassium and Alkali earth metals such as (**Ca**) to oxidize it? by burning

The production of **sodium and Barium, Calcium**. Sodium Peroxide and Barium Peroxide. how?

Minerals of Barium $BaSO_4$, $BaCO_3$.

Superoxides... what are they? uses

How to distinguish metal Peroxides?

calcium and magnesium peroxide (CaO_2), (MgO_2)

Both calcium and magnesium peroxide (CaO_2) are a solid peroxygens (classified Oxidizers) which slowly decompose to release oxygen at a "controlled" rate. They find use in bioremediation and composting operations, and in coating seeds to improve germination and seedling survival rates.

What is Sodium percarbonate? Look at oxidizers page and gather info for each compound.

Calcium Hypochlorite >50% 3rd grade oxidizer swimming pool? H.T.H. swimming pool chlorination compound and Sodium Chlorite >40%

Sodium Hypochlorite used as a bleach What is the Manufacturing process

Electrochemical industries producing Sodium Chlorate, Sodium Hypochlorite

Chemical Compounds and their daily uses

Calcium everything about it . look at periodric table and oxidizers. For calcium Hypochorite and peroxide

<http://yarchive.net/explosives/peroxide.html>

http://yarchive.net/explosives/chlorate_mk.html for making chlorate

<http://yarchive.net/explosives/sodium.html>

look at common [chemicals links](#)

http://yarchive.net/explosives/sodium_make.html how to make sodium.

[Oxidizers from tootse](#)

[Good info on oxidizers and fuels](#)

Calcium Carbide These grayish, irregular lumps are normally packed in waterproof and airtight metal containers. It is used in toy cannons. Mixed with water it forms Acetylene Gas. (EXPLOSIVE)

OXIDIZERS: From tootse.

GROUP:

peroxide O₂-₂

nitrate NO₃-

nitrite NO₂-

perchlorate ClO₄-

chlorate ClO₃-

chlorite ClO₂-

hypochlorite ClO-

permanganate MnO₄-

persulfate S₂O₈-₂

dichromate Cr₂O₇-₂

If you are stupid, and/or don't know about these chemicals then give up pyrotechnics.

How to synthesise oxidizers ...the easiest made oxidizer

How to Make Pure Sodium ?

Bunsen Burner?

Furnaces ? what kinds history making

Check tootse for new info.

[A good file on making a furnace](#) and achieving high temperatures.

➤ Sodium Carbonate form Bicarbonate (Baking powder)

Fine, dry sodium carbonate can easily be obtained by heating sodium bicarbonate (which itself is usually found as a fine powder) to convert it to the carbonate.

heat $2 \text{ NaHCO}_3 \text{ ----> Na}_2\text{CO}_3 + \text{CO}_2 + \text{H}_2\text{O}$

The anthraquinone process is a very smart process: It uses the anthraquinone to combine hydrogen and oxygen from the air to form H₂O₂

Recent advances in electrochemistry have demonstrated the [feasibility of producing hydrogen peroxide by the electrochemical reaction of oxygen and hydrogen in a fuel cell](#). The new process could significantly reduce the cost of producing hydrogen peroxide and provide an opportunity to make the [H₂O₂ from hydrogen and oxygen generated locally with renewable resources](#).

Patent# [6,685,818](#) Process for the electrochemical preparation of hydrogen peroxide - February 3, 2004

A good file on producing g peroxide via [fuel cell](#) .. There are two stages to the chemical reaction(In a fuel cell): at the end of the first stage, hydrogen peroxide is produced; in the second stage, the H₂O₂ is converted to H₂O - ie water.

http://en.wikipedia.org/wiki/Hydrogen_peroxide#Manufacture

fuel cell for Hydrogen Peroxide production .look at links [in the bottom](#)

[stoichiometric ratio for burnable material . adding burnable material \(fuels\) such as sugar etc rises the](#)

temperature of decomposition greatly to 1000-2000 deg from onl 360 without fuel(مختزل)

Patent# 6,712,949 Electrochemical synthesis of hydrogen peroxide

- Hydrogen peroxide used as a propellant look here in high concentration
- **Rocket Grade Hydrogen Peroxide**, also called **HTP** (High Test Peroxide)
- <http://www.peroxidepropulsion.com/article/3>
- www.ippe.com for plant systems and equipment.
- www.goodallpools.com/Default.aspx?tabid=96 for oxidizers use in pools
- www.efilmgroup.com/Specials/June-Special-Inorganic-Oxidizerscat.html
- www.ehs.uiuc.edu/css/guidesplans/wasteguide/dot/DOTOxidizerDef.doc

Barium salts -- Colouring Agents

Used to colour fires green. several are used:
Barium carbonate, BaCO₃ -- Colouring Agent,

Stabilizer

As well as being a green flame-colourer, barium carbonate acts as a neutralizer to keep potentially dangerous acid levels down in pyrotechnic compositions.

Barium chlorate, Ba(ClO₃)₂.H₂O -- Colouring Agent, Oxidiser

Barium nitrate, Ba(NO₃)₂

Barium oxalate, BaC₂O₄ -- Colouring Agent

A file mentioned using (H.T.H)Calcium Hypochlorite and Ammonium Nitrate (big blast)

How to prepare h₂o₂ from alkali earth metal peroxides and alkali metal peroxide

How to prepare h₂o₂ electro chemically

How to build an electrolytic cell for producing Na, H₂O₂, etc . (Downs cell) for molten Na

Sodium from sodium carbonate and carbon and a bit of chalk

Preparation of Oxidizers such as Calcium Hypo chlorite (look at oxidizer list)

What is sodium percarbonate?

www.freepatentsonline.com/4323465.html

look at wiki chemical resources

Sodium Chlorite....and sodium Hypochlorite preparation and manufacture ...cell everything

[Sodium carbonate peroxide](#)

[Chemical lab equipment definition](#)

Over the years, a wide variety of materials, primarily metals and strong oxidizing agents, have been produced electrolytically. Among those produced today are chlorine, sodium hydroxide, sodium chlorate, hydrogen, oxygen, aluminum, copper, magnesium, zinc, and a diponitrile, a raw material for the manufacture of nylon.

How to build a membrane cell ? Electrochemical reactors for producing Hydrogen Peroxide

[The principles of electrochemical engineering](#) .

these concepts include transport processes, current and potential distribution phenomena, thermodynamics, kinetics, scale-up, sensing, control, and optimization.

electrochemical systems.

Electrolysis cell

Send E-mail to those who knowlook for discussion forums .

Hydrogen Peroxide fuel mixtures for rockets and torpedoes

➤ hydrogen peroxide rocketsof

➤ manufacture of aluminum, magnesium, and sodium. By **electrolytic furnace.**

Manufacture of Na from the heat decomposition of **NaOH**

Sodium Hydroxide melts at 318C degrees Celsius and is decomposed into its elements at about 1300 C.



Sodium and its compounds from salt.

www.webelements.com/webelements/elements/text/Na/key.html

perpetration of Na from its compounds.

How is it produced(hydrogen peroxide) in Pakistan....seeking to micromize industrial processes of production.