



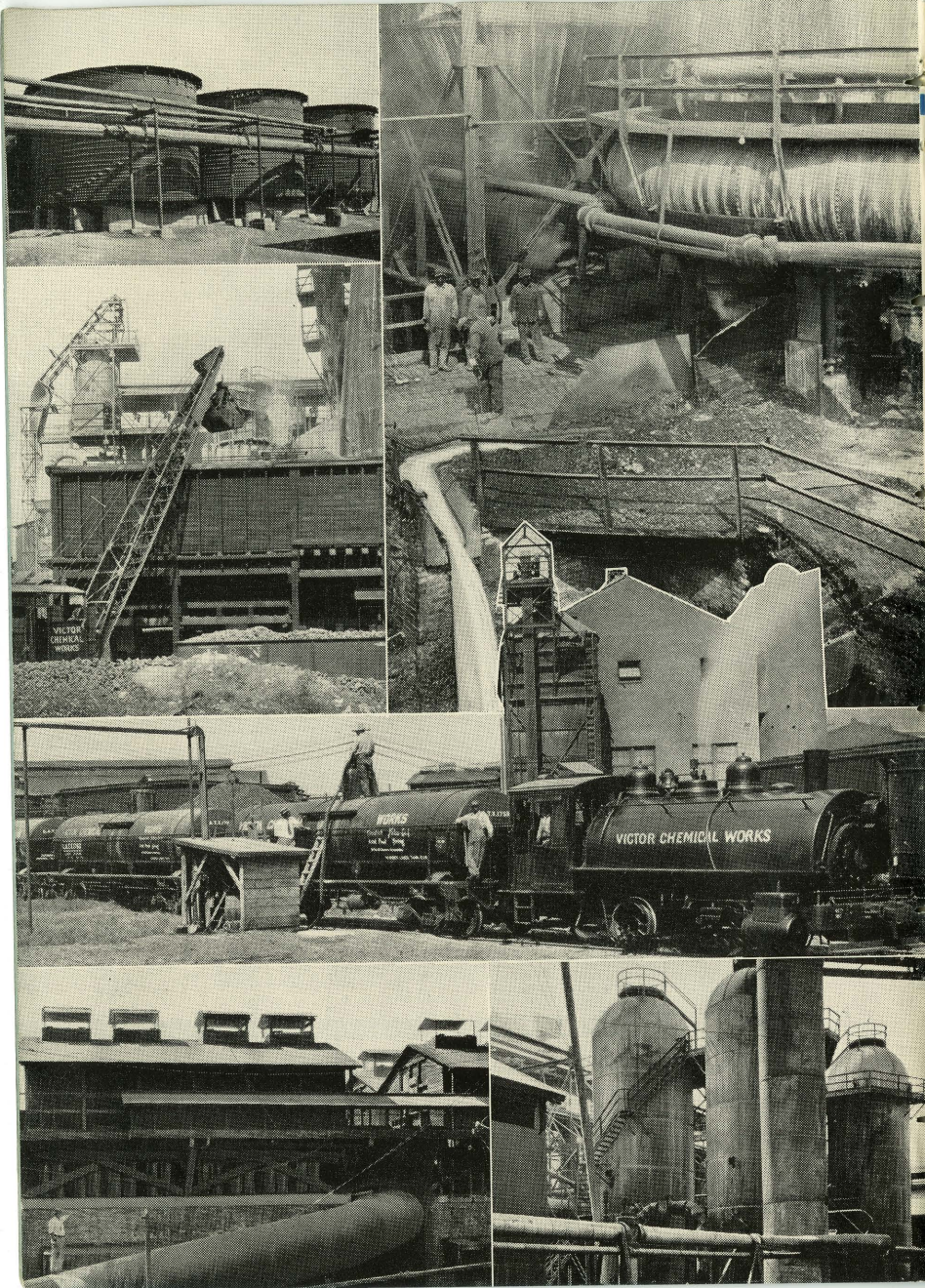
VICTOR  
CHEMICAL  
WORKS



**VICTOR CHEMICAL WORKS**



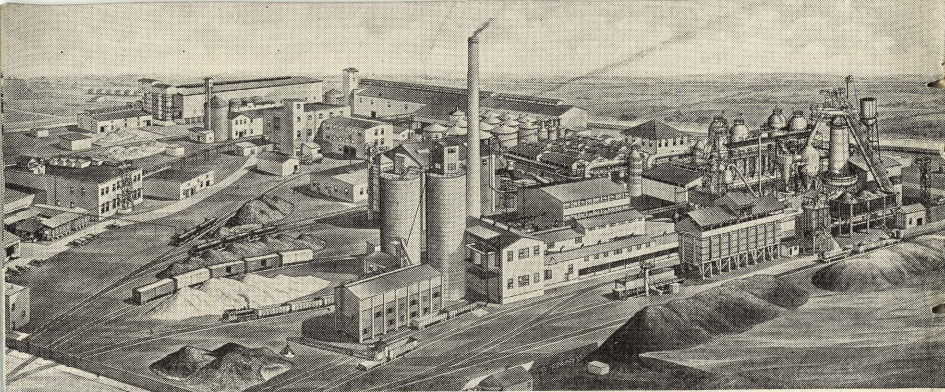




# VICTOR CHEMICAL WORKS

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**VICTOR CHEMICAL WORKS**  
 141 W. Jackson Boulevard • CHICAGO, ILL.  
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Above—Victor Chemical Works, Nashville, Tenn.

Below—Victor Chemical Works, Chicago Heights, Ill.

## ACHIEVEMENT

The "seven league" strides that modern business has taken during the past several decades, have been ably forwarded by the support of American chemical ingenuity. Serving as it does a thousand and one masters, the story of commercial chemistry has duplicated in fact the fanciful fiction of a modern Aladdin's lamp.

Thirty years ago the Victor Chemical Works, employing about a half-dozen men, began operations in a small plant at Chicago Heights, Illinois. . . . As the demands of industry steadily increased, production facilities were augmented. Development and manufacture of new products naturally followed.

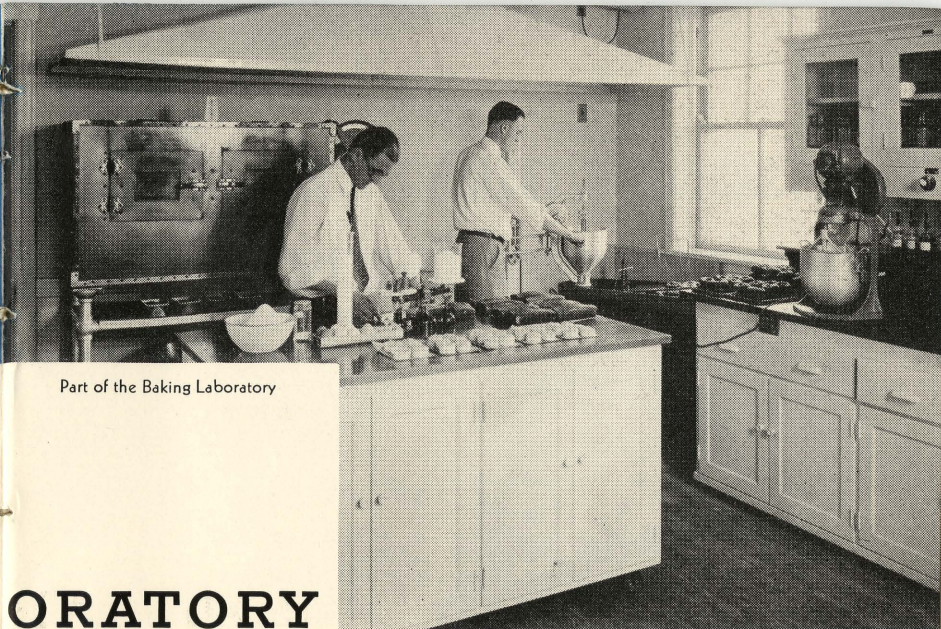
Today the Victor Chemical Works operates two large modern plants, one at Chicago Heights, the other at Nashville, Tennessee—the latter including the largest phosphoric acid generating unit in the world. Today, hundreds of factory workers and a staff of over eighty chemists, engineers and special assistants are employed, not only to insure the efficient operation of both plants, but to collaborate in experimental and research work with the technical departments of those whom it is our privilege to serve.

The Victor Chemical Works looks forward confidently to the future. A definite policy of energetically seeking better ways, . . . of fearlessly scrapping obsolete ideas and methods, . . . of constantly searching for new uses and new applications so as to expand the markets of those we serve as well as our own, cannot fail, we feel, to duplicate in the coming years the record of achievement that lies behind us.





View of the Research Laboratory



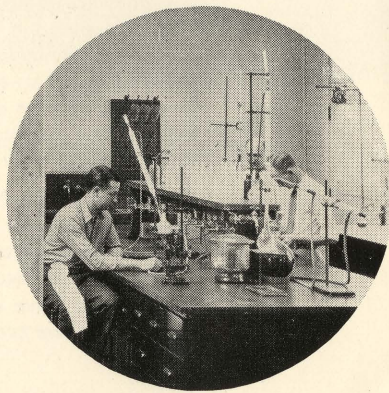
Part of the Baking Laboratory

## QUALITY... AND THE CONTROL LABORATORY

Constant contact will make even that which is extraordinary seem commonplace. Today . . . the sparkling, crystal clearness of Victor Phosphoric Acid . . . the free-flowing characteristics of Victor Tri-Sodium Phosphate . . . the fact that Victor Formic Acid doesn't cloud up when diluted or darken when exposed to light . . . or that Victor Oxalic Acid can be *guaranteed* 99.75% pure or better . . . all excite but little comment.

Yet these are really unusual qualities. It is simply that the very uniformity with which they have been maintained has made them seem ordinary . . . as though these were qualities naturally inherent in the product, when, as a matter of fact, behind each is a story of ceaseless effort, of painstaking, conscientious supervision.

If quality is to be maintained . . . particularly quality of a high degree . . . it is obvious



that haphazard methods are inadequate. In the chemical industry, only through the guidance of a vigilant control laboratory can such quality be assured.

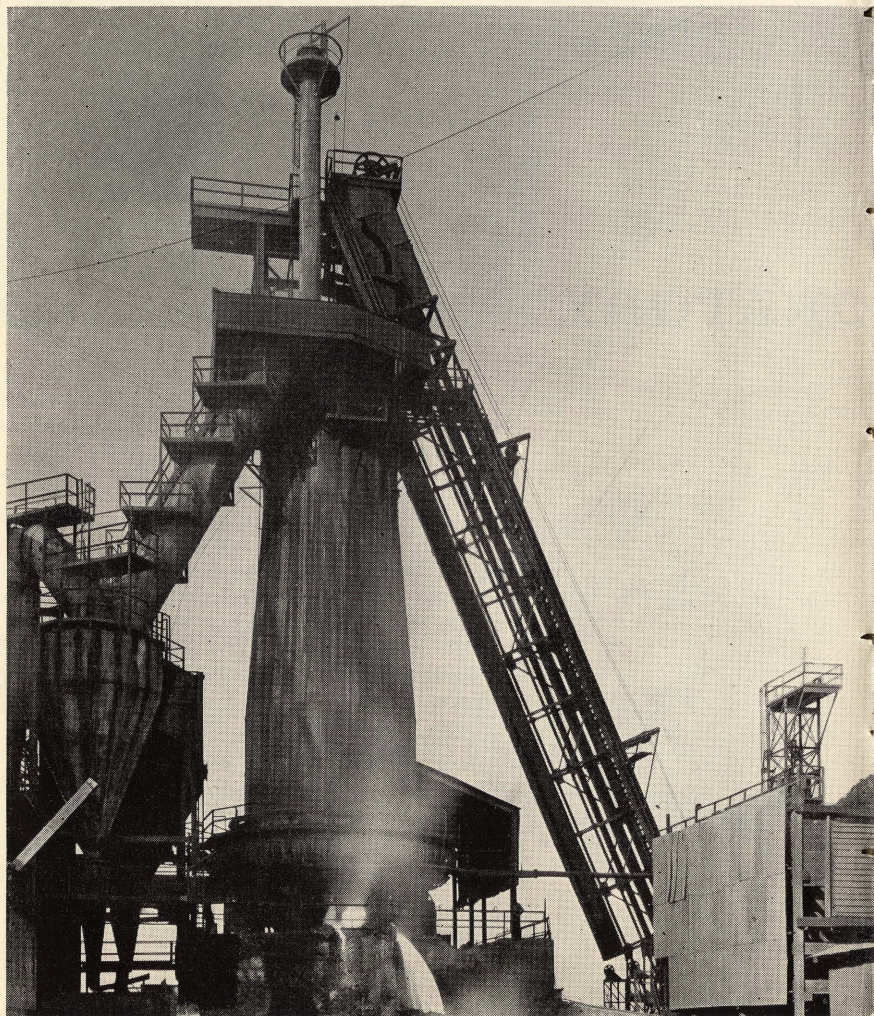
Practically speaking, this means that every carload of raw materials that comes into the Victor Chemical Works must be carefully analyzed. Each must conform with established standards. Then, at a score or more different points along the process of manufacture including, of course, all end-products, additional analyses must be made . . . hundreds of samples to be analyzed daily, compared with accepted specifications, rejected or approved and filed for future reference.

In this way only, can manufacturing proceed with maximum efficiency. In this way only, can exceptional purity and quality as well as the superior mechanical condition of Victor Chemicals be maintained year in and year out. The control laboratory must do its job well!



# THE PYROLYTIC PROCESS

## FOR MANUFACTURING PHOSPHORIC ACID



The "pyrolytic process" as applied to the manufacture of food-grade phosphates represents a distinct achievement of Victor chemical engineering. Formerly, phosphate rock was ground up and dissolved with sulphuric acid. This gave an impure phosphoric acid with a great volume of sludge which had to be removed by settling in large tanks. A further series of complicated operations removed as many impurities as possible, and finally the acid was concentrated by boiling.

By the new process the phosphate rock is smelted in a towering blast furnace that causes the elemental phosphorus to distill off as a gas. The latter is purified and then oxidized (or burned) to form phosphorus pentoxide, which, in turn, is hydrated, and collected by electricity to form Victor Phosphoric Acid . . . a sparkling water-white liquid that has established a new standard for purity and uniformity.



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# VICTOR CHEMICALS

## THEIR QUALITIES AND USES

### VICTOR PHOSPHORIC ACID ( $H_3PO_4$ )

A clear, colorless, sparkling liquid. In the lower strengths, it looks almost like water; in the higher concentrations it becomes more viscous until at 85% it greatly resembles a water-white syrup.

**Victor Phosphoric Acid**, product of the famous pyrolytic process, has established a new high standard in purity and uniformity. Its purity far exceeds the requirements of all Federal and State Pure Food Laws. Available in 50% and 75% strengths. Shipped in tank cars, oak casks, steel drums, and glass carboys. All of the various phosphatic salts and compounds produced by Victor and described on the following pages are made with Victor's pure phosphoric acid.

**Uses**—Phosphoric Acid is used extensively in the manufacture of food products such as leavening agents, bread improvers, yeast foods, salt and sugar fillers, vinegar, soft drinks, jellies, etc., in the manufacture of plant foods, fire-proofing agents, cleaning compounds, pharmaceuticals, dentifrice polishing agents, stabilizers for peroxides, etc., and in rust-proofing, metal cleaning, weighting silks, etc.



## VICTOR MONO-CALCIUM PHOSPHATE



A brilliant white material of unusual purity and uniformity. Exceptional purity includes complete absence of "free acid." Uniform in neutralizing strength: always "80" strength. Made from Victor Phosphoric Acid (see page 11). Shipped in bags, barrels, and kegs.

**Uses**—The principal use of mono-calcium phosphate is as a leavening agent and Victor Phosphate plays an important part in the manufacture of baking powder, self-rising flour, pancake flour, and other prepared flours. The advantages of chemical leavening,—its convenience, certainty of satisfactory baking results, and the health value of phosphate, are generally recognized. Phosphate is also used extensively in the baking industry as a "rope" preventive and bread improver.

## VICTOR DI-CALCIUM PHOSPHATE



A tasteless, crystalline, white material that is sparingly soluble in water. Three grades are manufactured by Victor as follows:

**Regular:** A practically chemically pure product that is used in bread improvers, pharmaceutical preparations, health foods, etc. Shipped in bags, barrels, and kegs.

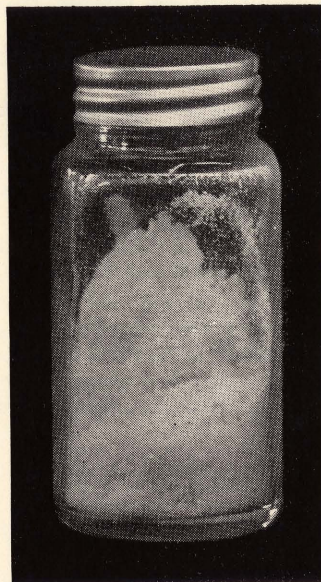
**Dentifrice:** Same purity as regular, but milled to an impalpable powder so fine that the largest particle is less than 1-1,200 of an inch in diam-

eter. Used as a polishing agent in tooth pastes and powder. An efficient cleanser and polisher, yet soft enough so as not to scratch the teeth nor abrade the enamel. Shipped in bags, barrels, and kegs.

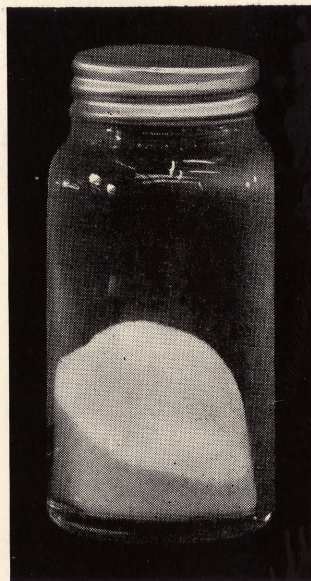
**Stock Food:** A special di-calcium phosphate for stock feed purposes, yet sufficiently pure for human consumption. Contains 48%  $\text{P}_2\text{O}_5$  and 37% lime in a condition that is easiest to assimilate in the digestive tract. Shipped in bags and barrels.







Contains No Tri-Calcium Phosphate



Contains 1% Tri-Calcium Phosphate

Showing effect of Tri-Calcium Phosphate as a filler to prevent caking

## VICTOR TRI-CALCIUM PHOSPHATE

( $\text{Ca}_3(\text{PO}_4)_2$ ) **Precipitated.**

A tasteless, pure white, finely divided material of exceptional purity. Shipped in barrels, kegs, and bags. Two grades are manufactured by Victor as follows:

**Regular**—A precipitated and air-separated material used principally as a conditioner for salt and sugar to prevent caking.

**Dense**—A more finely divided material of greater density than the "regular" but otherwise the same. Used as a polishing agent in tooth pastes and powder. Efficient, yet soft enough so as not to scratch. Offers some advantage over the "regular" as a conditioner in that its fineness provides greater covering capacity and thus better protection in preventing caking.

## VICTOR MONO-SODIUM PHOSPHATE

( $\text{NaH}_2\text{PO}_4 \cdot \text{H}_2\text{O}$ )

A white, crystalline material, soluble in water. **Victor Mono-Sodium Phosphate** is guaranteed to contain not less than 52%  $\text{P}_2\text{O}_5$ . Shipped in barrels, kegs, and bags.

**Uses**—In the treatment of *boiler waters*, Victor Mono-Sodium Phosphate may be used advantageously as a secondary treatment following lime-soda or zeolite softeners. While contributing  $\text{P}_2\text{O}_5$  to prevent scaling and embrittlement, at the same time it can be used either alone or in combination with other phosphates to maintain desired alkalinity in the boiler.



## VICTOR DI-SODIUM PHOSPHATE

(crystalline and anhydrous)

( $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$  or  $\text{Na}_2\text{HPO}_4$ )

A pure white, mildly alkaline, water soluble phosphate. Three grades are made by Victor: crystalline, anhydrous USP and anhydrous technical. Victor crystalline di-sodium phosphate contains 20%  $\text{P}_2\text{O}_5$ . The anhydrous USP contains not less than 49%  $\text{P}_2\text{O}_5$ . Both comply with the specifications of the U. S. Pharmacopoeia. The anhydrous technical contains not less than 48%  $\text{P}_2\text{O}_5$  and is suitable for use in food products. All three yield clear water solutions which is of particular importance to the textile and pharmaceutical industries. Shipments made in bags, barrels, or kegs.

**Uses**—In the *weighting of silks*, the use of Victor Di-Sodium Phosphate anhydrous is rapidly replacing the crystalline material. Since the anhydrous contains 48%  $\text{P}_2\text{O}_5$  as compared with 20% for the crystalline, one pound of the former material will do the work of 2.4 pounds of the latter. The economy in freight, storage, and labor charges is obvious. Furthermore, the anhydrous product rarely, if ever, cakes and is therefore easier to handle.

Victor Di-Sodium Phosphates are also used in the treatment of boiler water, as an emulsifier for casein, as a buffer in the dye-bath, in the manufacture of pharmaceuticals, etc.

## VICTOR TRI-SODIUM PHOSPHATE

( $\text{Na}_3\text{PO}_4 \cdot 12\text{H}_2\text{O}$ )

A brilliant white, free-flowing material of uniformly high quality. Because of its superior mechanical condition—due to a special ageing process—caking problems are reduced to a minimum with **Victor Tri-Sodium Phosphate**. Its uniform purity also results in a product that is immediately and completely soluble. No waste of time or material.

Available in four grades: chip, flake, fine, and powdered . . . with uniformity assured by careful screening and sizing. Shipped in barrels, kegs, and bags.

**Uses**—Tri-sodium phosphate because of its emulsifying and detergent properties is one of the best cleaning compounds known. It is noted for the efficiency with which it softens hard water. These three properties, plus the attractive appearance of Victor T. S. P. have made it a universally favored ingredient in popular packaged brands of household cleansers. Recommended for washing dishes, painted, varnished, or enameled surfaces, metal fixtures, fabrics, porcelain, linens, and even an oily garage floor. Gives a characteristic sparkle to glassware. Because of its efficiency, T. S. P. can be used in smaller quantities than other cleansers and without the application of high temperatures. Easily rinsed from hard surfaces and fabrics.

## VICTOR SODIUM PYRO-PHOSPHATE

(anhydrous) ( $\text{Na}_4\text{P}_2\text{O}_7$ )

A white material. Soluble in water. Alkaline in reaction. Shipped in barrels and kegs.

**Uses**—Stabilizing peroxide bleaching baths, tinplating, etc.



### VICTOR SODIUM ACID PYRO- PHOSPHATE ( $\text{Na}_2\text{H}_2\text{P}_2\text{O}_7$ )

A brilliant white powder. Soluble in water. **Victor Sodium Acid Pyro-Phosphate** is manufactured in two strengths: the pure product with a baking strength (in units of soda) of 72% and a diluted product standardized with cornstarch to a baking strength of 50%. Shipped in barrels and kegs.

**Uses**—Highly recommended as a *baking acid*. Has a very slow uniform action. Conserves a greater percentage of gas for effective leavening than any other baking acid. Permits the use of a smaller amount of leavening material.

### VICTOR MONO-AMMONIUM PHOSPHATE

( $\text{NH}_4\text{H}_2\text{PO}_4$ ) (mildly acid)

A brilliant white crystalline product. Soluble in water. **Victor Ammonium Phosphate** is recognized for its high purity and uniform quality. It gives a clear water solution and meets the requirements of Federal and State Pure Food Laws. Shipped in barrels, kegs, or bags.

**Uses**—One of the most important uses today is in the impregnation of wood and textiles for *fireproofing* purposes. Since insoluble particles would tend to clog wood and fibre pores and retard penetration, the fact that Victor Ammonium Phosphate gives a clear water solution is a decided advantage.

Also used to prevent the after-glow in matches and as a yeast food and bread improver.

### VICTOR DI-AMMONIUM PHOSPHATE ( $(\text{NH}_4)_2\text{HPO}_4$ ) (mildly alkaline)

Qualities and uses practically the same as the mono basic product.

### VICTOR PHOSPHORIC ANHYDRIDE ( $\text{P}_2\text{O}_5$ )

A pure white powder that absorbs moisture from the air with avidity forming meta, pyro, or ortho phosphoric acid depending upon the amount of water absorbed and upon conditions under which absorption takes place. When  $\text{P}_2\text{O}_5$  comes in direct contact with water, steam and heat are developed with explosive violence. Shipped in air-tight steel drums.

**Uses**—Preparation of organic phosphorus compounds, as a drying agent, catalyst, etc.

### VICTOR PHOSPHORUS (P)

A practically colorless, translucent, wax-like material that fumes when exposed to air. Extremely pure through Victor process. Burns spontaneously in warm air to form  $\text{P}_2\text{O}_5$  which when added to water forms Phosphoric Acid. Stored under water. Shipped in water filled metal drums.

**Uses**—Manufacture of phosphorus alloys, phosphoric anhydride ( $\text{P}_2\text{O}_5$ ), phosphoric acid, hypo-phosphites, phosphorus chlorides, smoke screens, pyrotechnics, rat poison, etc.



## VICTOR FERRO PHOSPHORUS

Ferro phosphorus is a heavy, brittle, metallic looking compound containing 75% of iron and 25% of phosphorus.

**Uses**—In an open-hearth furnace ferro phosphorus is added to steel which is to be rolled into sheets. The steel is rolled hot in bundles, and if the phosphorus were absent, the sheets would tend to weld together. The presence of the phosphorus prevents this welding effect and the sheets are easily separated from each other when the rolling is completed.

## VICTOR TRIPLE SUPER PHOSPHATE

A highly concentrated fertilizer material.

Victor Triple Super Phosphate is today being used by leading fertilizer manufacturers and growers. It is uniform in quality, dry, mealy and granular. It mixes in any proportion with other fertilizer ingredients or may be used for direct crop application.

Victor Triple Super Phosphate is made by treating high grade Tennessee phosphate rock with Victor Phosphoric Acid. A typical analysis is: moisture 3%; available  $P_2O_5$ , 47%; water soluble  $P_2O_5$ , 44%. Quality is guaranteed by Victor's thirty years of experience in the manufacture of phosphates. Shipped in bulk or bags.

## VICTOR SODIUM FORMATE

( $NaCOOH$ )

An odorless white powder soluble in water. Shipped in barrels or kegs.

**Uses**—Preparation of aluminum formate, in the manufacture of formic and oxalic acids, as a reducing agent, etc.

## VICTOR FORMIC ACID

( $HCOOH$ )

A fuming, colorless, corrosive liquid that evaporates completely on exposure to the air. Middle-strength: milder than muriatic or sulphuric acid; considerably more active than acetic acid. Manufactured in 85% and 90% strengths.

**Victor Formic Acid** is noted for its purity, uniformity, and stability. Will not darken when exposed to light. Will not cloud up when diluted. Free from sulphuric acid and sulphur-bearing compounds as well as chlorides. Shipped in carboys.

**Uses**—In recent years the use of Formic Acid as an acidulant in the dye-bath has been adopted by an increasing number of *textile colorists*. Since it is a comparatively mild acid, it may be used advantageously in the dyeing of silk or wool textiles as well as cotton, rayon, etc. Will not tender delicate fabrics as is likely with stronger acids. Saves dyes by exhausting the dye-bath completely. Produces colors that are more level and fast—even in cross dyeing. Imparts no objectionable odor and leaves no acid residue in any material.

Because of this last mentioned quality, formic acid is highly recommended as a sour in the *laundry* and in the *tanning* and *dyeing* of furs and skins. Its complete volatility gives assurance that no residue will remain in the material treated to cause tendering or impart an objectionable odor.

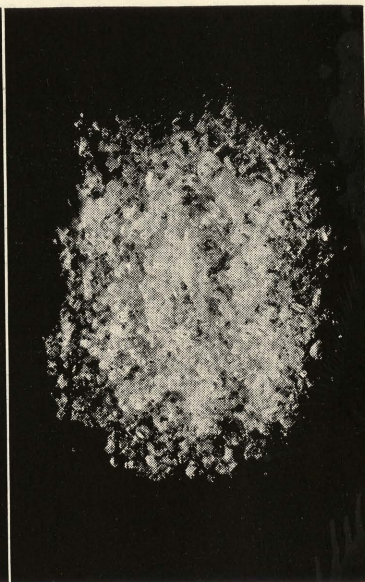
Formic Acid is also used in the manufacture of nickel formate, fumigants, insecticides, refrigerants, solvents for perfumes, lacquers, etc.

*A special booklet discussing in detail the use of formic acid in the textile mill and written by a prominent textile colorist will be sent on request.*



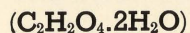


(Oxalic Acid—Powdered)



(Oxalic Acid—Small Crystals)

## VICTOR OXALIC ACID



A crystalline white product completely soluble in water. **Victor Oxalic Acid** is guaranteed 99.75% pure or better—absolutely free from sulphuric and hydrochloric acid. It is available in three crystallizations: large, small, and powdered. Careful screening assures uniform mechanical condition. Shipped in barrels and kegs.

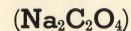
**Uses**—Oxalic Acid is used in a wide variety of industries. In the *laundry* it is a universally popular sour and is the best known reagent for removing rust stains from fabrics.

It is also used in the bleaching of wood, cork, cotton, straw and rosin, in the dyeing of textiles, refining ores or rare metals, washing coal, as a solvent for iron compounds, and in the manufacture of tanning and leather stuffing compounds, chemicals for blue-printing, etc.



(Oxalic Acid—Large Crystals)

## VICTOR SODIUM OXALATE



A crystalline product that is moderately soluble in water. Victor Sodium Oxalate is guaranteed 99% pure or better. Shipped in barrels, kegs, and bags.

**Uses**—Pyrotechnics, blue-printing, textile finishing, tanning and finishing leather, etc.



## VICTOR CHEMICAL WORKS—CHICAGO

### VICTOR MAGNESIUM SULPHATE

( $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ ) (Epsom Salt, U. S. P.)

A crystalline white material with a salty taste commonly known as Epsom Salt. Soluble in water.

In **Victor Epsom Salt** a unique crystallization is offered—long needle-like crystals of exceptional brilliance and transparency. Shipped in barrels, kegs, and bags.

**Uses**—Medicinal purposes, fortifying spring water, leather tanning, loading cotton goods, paper sizing, bath salts, ceramics, etc.





