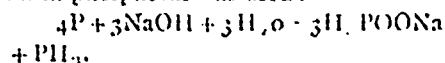


- at 20°C. under a pressure of 750^{mm}. How much phosphorus was used?



(Atomic wt. of phosphorus 31.)

5. Show by equations the action of (a) hydrochloric acid and (b) sulphuric acid upon ethyl alcohol. Give the graphic formula of ethyl alcohol and of the aldehyde and acid it yields upon oxidation.

6. Describe briefly Marsh's (hydrogen) test for arsenic, explaining the nature of the reactions which occur.

7. Give a method for the preparation of magnesium carbonate, of potassium cyanide and of hydrogen peroxide. Why is ozone a more active oxidizing agent than ordinary oxygen?

8. Give a method for the detection of the acids in a solution of:

(a) Sulphates and nitrates.

(b) Sulphites and citrates.

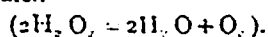
And of the bases in a solution of:

(c) Salts of iron and copper.

(d) Salts of lead and silver.

The following may be substituted for any one of the above questions:

A certain solution of hydrogen peroxide contains 3 per cent. by weight of the anhydrous peroxide (H_2O_2). Another solution of the same substance yields 15 volumes of available oxygen (at standard temperature and pressure). Compare the strength of the two solutions, assuming both to have the same specific gravity as water.



9 and 10. Oral examinations.

Values—12, 8, 12, 10, 10, 10, 8, 10, 20.

BOTANY.

Examiner—CHARLES R. SEAR.

Time Allowed, Two Hours.

1. (a) What are the pteridophyta?

(b) Describe mode of reproduction.

2. Chlorophyll.—Explain fully its uses and properties.

3. What are buds? Enumerate and define the different kinds of buds.

4. What is a fruit? Classify and explain.

5. Define the terms: (a) Species (b) phyllotaxy, (c) perianth, (d) stolon, (e) dicocious.

6. What is inflorescence? (a) Explain the different kinds, (b) describe corymb, umbel, raceme.

7. Enumerate fully all the differences between exogens and endogens.

8. Describe a plant cell.

Values—10, 10, 10, 10, 10, 10, 10, 10.

Pharmacy in England.

Urotropine — Terpeneless Essential Oils — Headache Remedies — Effervescing Sulphate of Sodium — Kodak Limited — Chloride of Ethyl for Local Anesthesia.

(From our own Correspondent.)

One of the latest new remedies that is receiving some degree of popularity is urotropine, a compound of formaldehyde and ammonia, patented by Schering. It was introduced first as a uric acid solvent and substitute for the expensive piperazine, it being claimed that it speedily dissolved all concretions, besides exerting a diuretic action. But lately it has been discovered most useful in cystitis and purulent urine, clearing the pus from the urine no doubt, because in the system the formaldehyde exerts its antiseptic properties. Chemically urotropine is hexamethylene-triamine, and although the phonetic approximation to atropine has already troubled the soul of one of our leading pharmacists, it is no doubt more convenient than its chemical name. It occurs in small colorless crystals or crystalline powder, easily soluble in water, less soluble in alcohol, and almost insoluble in ether. It is unquestionably an interesting compound, and the manufacturers have not fixed a prohibitive price, whilst they supply it in tablet form at a nominal increase on the ordinary price. The dose is 5 to 15 grains, the tablets being 7½ grains each.

Some time ago I drew attention in these columns to Heinrich Haensel's Terpeneless Essential oils, although I was not able to speak very favorably about the only specimen I had then examined. The number of oils prepared by a special process, which is Herr Haensel's secret, and only briefly described as consisting of the combined oxygenated constituents of the natural oil, now amounts to nearly thirty. Some of these are of undoubted utility. Especially in the manufacture of soluble essences for aerated waters, liqueurs, and cordials. Curiously enough the terpeneless oils are more soluble in the diluted alcohol than the original oils, and consequently stronger preparations are produced. This is largely balanced by the considerable increase in the cost. Thus in the case of terpeneless oil of bay, the increased strength claimed for it is only four times that of the commercial oil, and the price more than four times as dear. On the other hand terpeneless lemon oil

is claimed to be thirty times as concentrated, and the result is not so bad. Amongst the oils that produce good results can also be included calamis oil, where one and a half drachms suffice to flavor twenty-two gallons of liqueur. The oil of orange is so powerful that it is claimed that five minims will flavor one gallon of syrup. If it is permitted to hazard a guess as to the method of producing terpeneless oils, the most probable method is distillation of the purest commercial specimens under reduced pressure, and removal of all valueless stearoptenes by subsequent freezing.

Chloride of Ethyl is being extensively used for the purpose of producing local anesthesia since the glass tubes were introduced, by means of which the heat of the hand alone is sufficient to eject a fine spray on removing the cap. The liquid is of light specific gravity, like ether, and produces its effect by reason of the cold resulting from its rapid evaporation. The spray is directed to the part requiring to be anesthetised, holding the tube some six or eight inches off, and aiding the evaporation by gently blowing. At first a pink patch is produced, quickly followed by a white place, which denotes that the part is anesthetised. This usually only takes about 20 to 30 seconds, and passes off in a couple of minutes, leaving a reddish spot with a slight tingling behind. It has been found by one observer that the temperature beneath the skin can be reduced to 16° below zero, but the advantages claimed is that no ill effect is produced upon tissues. Even if the surface is tender or exposed the pain can be obviated by smearing the part with vaseline and then applying the spray. More painful parts still or deeper-seated structures can be reached by first applying a compress dipped in 5 per cent. cocaine solution, and when the surface is thus locally anesthetised the spray freely applied. It has proved most successful in removing adenoids or small pustules, or when squeezing the pustules of acne, in operations for in-growing toe-nails, etc., and minor operations generally. It was formerly recommended for dental extractions, but certain precautions must be