

Kalorien	2000
Eiweiss	54 g.
Fett	56 g.
Kohlehydrate	250 enthält.

Diese Kost besteht pro Kopf und Woche aus 1120 g. Brot, 110 g. Oel, 256 g. Linsen, 160 g. Blumenkohl, 256 g. Bohnen, 800 g. roten Rüben, 800 g. Löwenzahn, 640 g. Korinthen, 640 g. getrockneten Feigen, 320 g. Oliven, 320 g. gesalzenen Sardinen, 640 g. Mandeln, 192 g. Weisskäse, 48 g. Zucker und 2240 g. Landwein.

Die Ausgaben für die Anschaffung dieser Nahrungsmittel betragen zur Zeit (Februar 1942) 3095 Drachmen pro Kopf und Woche. Das Einkommen weiter Kreise der Bevölkerung gestattet kaum eine üppigere Kost. Es wird Manchen befremden, dass wir in diese Kost den Wein aufgenommen haben. Dies geschieht unter dem Zwang der gegenwärtigen Verhältnisse. Wein ist in Griechenland eine relativ billige Energiequelle.

ΑΝΑΚΟΙΝΩΣΕΙΣ ΠΡΟΣΕΔΡΩΝ ΜΕΛΩΝ

Γ. Γεωργαλά. - α) Συμβολή εις τὴν γνῶσιν νεοφυτογενῶν τινῶν ἐκρηξιγενῶν πετρωμάτων τῆς νήσου Ἰμβροῦ. β) Συμβολή εις τὴν γνῶσιν τῶν ἐκρηξιγενῶν πετρωμάτων τῆς νήσου Μυτιλήνης (πρώτη ἀνακοίνωσις).

ΑΝΑΚΟΙΝΩΣΕΙΣ ΜΗ ΜΕΛΩΝ

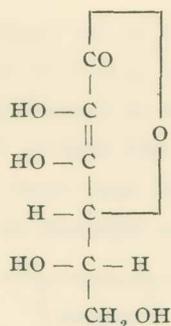
ΑΝΑΛΥΤΙΚΗ ΧΗΜΕΙΑ. — **Ascorbic acid (vitamin C) as an analytical reagent. I. Detection of small amounts of Gold.*** — by *E. C. Stathis*. Ἀνεκοινώθη ὑπὸ τοῦ κ. Κ. Ζέγγελη.

Ascorbic acid which is called vitamin C was isolated by Szent - Györgyi¹ in 1928 on account of its reducing activity.

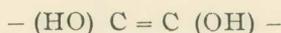
The synthesis of ascorbic acid was effected almost simultaneously by Reichstein² and Haworth³ and co-workers in 1933.

The structural formula for ascorbic acid is that which was finally propounded by Haworth and Hirst. Its constitution is represented in the formula given below:

* Ε. ΣΤΑΘΗ, Τὸ ἀσκορβινικὸν ὄξύ (βιταμίνη C) ὡς ἀντιδραστικόν εἰς τὴν ἀναλυτικὴν χημείαν.
— I. Ἀνίχνευσις τοῦ χρυσοῦ εἰς μικρὰ ποσά.



From the above formula it is evident that its peculiar reducing activity is due to the characteristic endiol group



Based on these considerations we have therefore sought to use ascorbic acid as an analytical reagent.

In the present paper a study was made of the reaction between gold chloride and ascorbic acid.

EXPERIMENTAL

By adding an aqueous solution of ascorbic acid to a dilute solution of gold chloride (AuCl_3), the solution becomes brilliantly colored reddish-brown to reflected light and blue to the transmitted. This is due to the fact that colloidal gold is formed as shown by the immediate appearance of Tyndall effect.

The solution shows as well Brownian movement when examined under the Ultramicroscope and it is decolorised by the addition of electrolytes and heating.

The detailed investigation of this reaction has proved that it can be effectively used to trace small amounts of gold.

Various experiments have shown that an aqueous solution 0,1 % of ascorbic acid makes a satisfactory reagent solution. The following aqueous solutions of gold chloride (AuCl_3) were prepared to determine the sensitivity of the reaction.

(A) Solution. (0,04 gr. Au %). This solution was prepared by dissolving 0,0618 gr. of AuCl_3 in 100 c. c. of water.

(B) Solution. (0,004 gr. Au %). 10 c. c. of (A) solution, were diluted to 100 c. c.

The tests were carried out in the usual test tubes.

To 5 c. c. of (A) solution, 4 c. c. of water and 1 c. c. of the reagent were added. A colored solution is immediately produced having a reddish brown color to reflected light and blue to the transmitted. For those tests various portions of the solutions were used.

The following results were obtained by the above method.

Solution of Gold	Water	Reagent	Color	Gold in grams
5 c. c. A solution	4 c. c.	1 c. c.	Reddish - brown -- Blue	0. 00200
2 c. c. »	7 c. c.	1 c. c.	» » »	0. 00080
1 c. c. »	8 c. c.	1 c. c.	» » »	0. 00040
0.5 c. c. »	8.5 c. c.	1 c. c.	» » »	0. 00020
2.5 c. c. B	6.5 c. c.	1 c. c.	» » »	0. 00010
1 c. c. »	8 c. c.	1 c. c.	Faintly rose then blue	0. 00004
0.5 c. c. »	8.5 c. c.	1 c. c.	Faintly blue	0. 00002
0.25 c. c. »	8.75 c. c.	1 c. c.	» »	0. 00001

From the various experiments carried out it was observed that the color intensity of the solution varies with the gold concentration and does not fade on standing.

From the above it is evident therefore that the described reaction can be effectively used for the colorimetric determination of small amounts of gold.

Influence of various ions. In order to study the effects of various ions, solutions of the salts used were prepared so that would contain 2 gr. of the desired ion in 100 c. c.

Several experiments showed that ions of Silver (Ag^+), Mercury (Hg^{++}), Bismuth (Bi^{+++}), Tin (Sn^{++}), (Sn^{++++}), Antimony (Sb^{+++}), (Sb^{++++}), Arsenic (As^{++++}), (AsO_3^{---}), Chromium (Cr^{+++}), Iron (Fe^{+++}), (SeO_3^{--}), (TeO_3^{--}), and (VO_4^{---}) must be removed before the reaction is carried out. Some of them, either precipitate or hydrolyse, whilst others produce various colors which cause the destruction of the reaction.

Copper (Cu^{++}), Cobalt (Co^{++}) and Nickel (Ni^{++}) have no effect, but when the amount of gold is less than 0,0001 gr. in 10 c. c. they prevent the reaction because of their own color.

Aqueous solutions of K_2CrO_4 , Na_2MoO_4 and Na_2WO_4 do not react

with the reagent but when gold is present they are reduced, producing green, blue and violet colors.

From the metals of the Platinum group IrCl_3 does not prevent the color of the reaction while the other metals in the presence even of small amounts of gold confuse the color of the reaction.

The presence of (Pd^{++}) , (Cd^{++}) , (As^{+++}) , (Al^{+++}) , (Ti^{+++}) , (Mn^{++}) , (Zn^{++}) , (Ca^{++}) , (Mg^{++}) , (Ba^{++}) , (Sr^{++}) , (UO_2^{++}) , (AsO_4^{---}) , (SeO_4^{---}) and (TeO_4^{---}) has no effect on the reaction at all.

In order to eliminate the presence of other metals which have undesirable effect on the reaction the well known analytical methods can be applied.

CONCLUSION

From the above experiments it has been definitively proved that ascorbic acid is an excellent and sensitive reagent for gold.

Also its reducing activity and the fact that it is an easily available reagent indicate its application for the detection and determination of many metals.

Further studies on the use of ascorbic acid are under consideration.

REFERENCES

- ¹ Biochem. Journ. (22) 1387 (1928).
- ² Helv. Chim. Acta (16) 1020 (1933).
- ³ J. Chem. S. (1933) 1270.

ΠΕΡΙΛΗΨΙΣ

Ὁ συγγραφεὺς περιγράφει νέαν μέθοδον ἀνιχνεύσεως χρυσοῦ στηριζομένην εἰς τὸν σχηματισμὸν κολλοειδοῦς χρυσοῦ διὰ τῆς ἀναγωγικῆς ἐπιδράσεως ἀσκορβινικοῦ ὀξέος ἐπὶ χλωριούχου χρυσοῦ.

Ἡ εὐαισθησία τῆς ἀντιδράσεως, ἡ ἀπλότης αὐτῆς καὶ ἡ σταθερότης τῶν ἐμφανιζομένων χρωμάτων καθιστῶσι τὴν μέθοδον ταύτην ἐφαρμόσιμον εἰς τὸν χρωματομετρικὸν προσδιορισμὸν τοῦ χρυσοῦ.