

GUAIACOL CARBONATE-----A REVISION

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Guaiacol Carbonate- A Revision.

In 1902 Ehlert made an extended survey of the guaiacol carbonates used in medicine. After a period of twenty years, it was thought best to revise Ehlert's work and bring the subject up to date. With this purpose in mind the various subjects treated by Ehlert were assigned to several students. Guaiacol carbonate was the subject given the writer. Ehlert's mimeographed sheets on guaiacol carbonate were used as a basis for this revision. Literature including books and periodicals published before and after 1902 up until the present time was diligently reviewed with reference to the subject assigned. It was found that very few changes were necessary in the text of Ehlert's work. A few synonyms, tests for purity and identification, and a few other minor changes have been made. The bibliography has been practically doubled.

Synonyms

- | | |
|--|--|
| 1. Guaiacol carbonate -1 | 14. Guajakal karbinate -9 |
| 2. Guaiacol carbonus -1 | 15. Guaiacol Carboxyligues
(acid) -10 |
| 3. Guaiaculus carbonus | |
| 4. Neutral guaiacol carbonate -1 | |
| 5. Guaiacol ester carbonate -2 | |
| 6. Guaiacol ether of carbonic acid -1 | |
| 7. Carbonic acid ester of guaiacol -3 | |
| 8. Di-guaiacol ester of carbonic acid -4 | |
| 9. Guajacol (or Guajakol) Karbonat. -5 | |
| 10. Guajacolum carbonicum -5 | |
| 11. Kohlensaurer Guajakyläther -5 | |
| 12. Kohlensäure Guajacyläther -6 | |
| 13. Duotal -5 | |

History

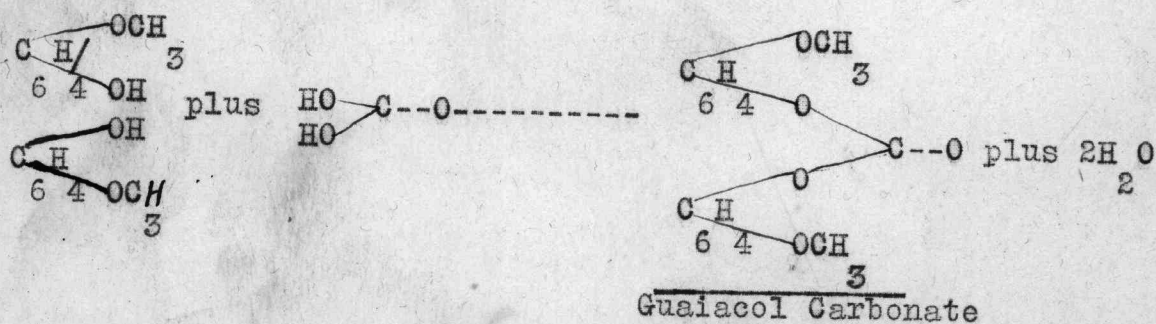
Guaiacol carbonate¹ or duotal⁵ was placed upon the market by F. v. Heyden's Nachf., Radebeul, in 1891, i. e. one year after the appearance of "Benzosol"¹¹. The compound seems to have been the direct outcome of the desire on part of manufacturers to produce useful esters of o-guaiacol which would follow the success and generally acknowledged applicability of benzoyl guaiacol¹¹ discovered by Bongartz.¹² This search, inaugurated for efficient guaiacol esters, has resulted in numerous derivatives of the potent substance of creosote since 1890, but it is certain that none of them have thus far enjoyed the popularity and widespread use that has and is still being given duotal.

Guaiacol carbonate owes its introduction into modern therapy to the work of Hoelscher,¹³ who noted the beneficial results attendant upon its use at the hospital at Mülheim a/Rh.¹³

Guaiacol carbonate was introduced into the United States Pharmacopoeia with the edition of 1900 and it is still official. It is also official in the pharmacopoeias of Germany.

Formation

Duotal may be thought of as formed by the condensation of two molecules of o-guaiacol and one molecule of carbonic acid.¹⁴ This would give the compound a structure as indicated in the following reaction:-



Physical Properties

Duotal is a white, micro-crystalline powder, totally devoid of taste or smell. Upon being taken into the mouth it imparts a sensation of grittiness. It is insoluble in water, sparingly soluble in cold alcohol, in glycerine, or in the fatty oils, but readily soluble in hot alcohol or in ether, chloroform or benzol. Its melting point is given as lying between 86 degrees and 90 degrees C. ⁴⁻¹⁵ A commercial sample tested by the writer melted at 85 degrees C. It corresponds to 91.5 p.c. of pure o-guaiacol.

Chemical Properties

1. Guaiacol carbonat is hydrolyzed into o-guaiacol and potassium carbonate when treated with alcoholic KOH solution.
2. It does not yield the characteristic guaiacol reaction with ferric chloride T. S. before hydrolysis, but after hydrolysis this test is given.

Test for Impurities

When guaiacol carbonate is treated with sulphuric acid not more than a faint yellow color should be produced. It should yield, upon incineration, not more than 0.1 of ash.

Test for Identification

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To about .02 grams of the sample dissolved in 1 CC of alcohol, add 2 drops of ferric chloride, test the solution, and then add one drop of formaldehyde solution. Then pour the mixture upon the surface of two mills of sulphuric acid. The result will be a cherry red coloration due to the guaiacol at the function of the two liquids.

Therapeutic Properties

Guaiacol carbonate as a tasteless, non-poisonous, irritating, or caustic compound with an exceedingly high percentage content of guaiacol (91.5 p.c.), in which respect it is exceeded by only two substances, viz. guaiacol phosphate and phosphite.¹⁶

It possesses all of the curative properties of creosote and guaiacol besides some distinctively its own, but none of the objectionable features characteristic to the substances just named. The acknowledged beneficial influence of creosote, respectively guaiacol, in phthisis, typhoid, and affections in which the use of a powerful intestinal antiseptic is indicated, assures a secure place for duotal in modern therapy.

Taken into a stomach of normal condition, the compound passes this unchanged to be resolved into its components in the intestines, where these then exert their antiseptic properties.¹⁷

If taken into an unhealthy stomach its activity begins there.¹⁷

¹⁷⁻¹⁸ Hoelscher states that increase of appetite and, consequently, of weight and strength, attends its use by tuberculous patients, and that a diminution of coughing and a lessening of purulent expectoration accompanies this. Night sweating is said to be checked, as is also the fever. In fact, its use in phthisis is productive of a general improvement of marked nature.^{17 ✓}

The employment of duotal in typhoid is followed by prompt destruction of the pathogenic bacterial life. This is probably due to the readiness with which its potent substance is liberated and the ease with which this may be absorbed.¹⁹ Traces of

guaiacol may be found in the urine, as guaiacyl sulphuric acid,

one half hour after administration of duotal.

The compound's insolubility in water limits the forms of administration to pill, capsule, powder, or oleosaccharate. The dose is from .0.20 to 1.25 grams (3 to 20 grains) three or four times pro die. The smaller quantity should be begun with and the dose gradually increased until 5.0 grams daily are taken.

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