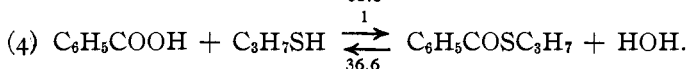
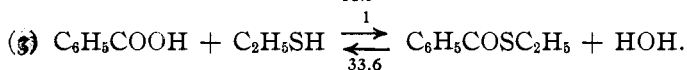
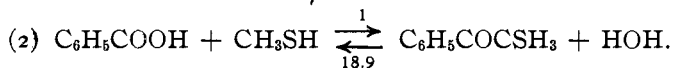
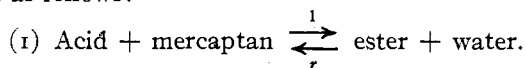


Conclusions.

(1) It has been conclusively shown that the mercaptans are entirely analogous to the alcohols in esterification.

(2) The limits obtained, using mercaptans, follow, in general, relations observed using alcohols, but are much lower.

(3) The reactions between methyl, ethyl and propyl mercaptans and benzoic acid, and between the thiol-esters and water at 220° may be represented as follows:



(4) The stability of the esters was found to decrease with increase in molecular weight.

(5) The limit was found to be independent of the proportions of the reacting substances.

(6) The limits were found to ascend gradually with rise in temperature.

This work will be extended to other mercaptans and to other acids, and will include a study of secondary and tertiary mercaptans. The latter phase should prove to be of special interest on account of the relations observed using secondary and tertiary alcohols.

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PHENOLQUINOLINEIN, A HETEROCYCLIC ANALOG OF PHENOLPHTHALEIN.

By ARTHUR W. DOX.

Received June 19, 1915.

The similarity in behavior of quinolinic acid and phthallic acid was pointed out by Bernthsen and Mettegang¹ in 1887. These investigators showed that quinolinic anhydride reacts with benzene in the presence of aluminium chloride, according to the Friedel-Crafts reaction, to form benzoylpyridine carboxylic acid, just as phthallic acid under similar conditions yields benzoylbenzoic acid. They succeeded also in preparing a condensation product of quinolinic anhydride with resorcin, corresponding to fluorescein, which they named fluorazein. Like fluorescein it was strongly fluorescent, and on treatment with bromine it yielded an eosin-like dye.

¹ *Ber.*, 20, 1208 (1887).

The writer thought it might be of interest to prepare the analog of phenolphthalein by condensing quinolinic anhydride with phenol, and to ascertain whether the resulting product would have the properties of an indicator.

Quinolinic acid was converted into its anhydride by heating with acetic anhydride and washing out the acetic acid and excess of acetic anhydride by means of carbon tetrachloride. Phillips¹ recommends heating one part of the acid with two parts of acetic anhydride to 120°, then gradually raising the temperature to 150°. The writer found that a quantitative yield of the anhydride was obtained by gently heating the mixture until solution was effected, then simply boiling for five minutes. On cooling, the anhydride separated out, and after washing with carbon tetrachloride, it showed the correct melting point of 134°.

Ten grams of quinolinic anhydride, 20 g. phenol, and 8 g. of concentrated sulfuric acid were heated in an oil bath at 120° for ten hours. The mixture was then poured into water, and the solution boiled until the excess of phenol was expelled. A yellow granular precipitate formed, which was collected on a filter, then dissolved in alcohol and purified by boiling with charcoal. A nearly colorless solution was obtained, which on evaporating and diluting with water became milky and finally yielded a yellowish granular sediment. The product was analyzed for nitrogen by the Kjeldahl-Gunning method.

Calc. for C₁₈H₁₃NO₄: N, 4.56; found, 4.50.

Like phenolphthalein, phenolquinolinein is a brilliant indicator, giving an intense pink color with alkalis which is immediately discharged on acidifying. On account of the basic nature of the pyridine nucleus, the end point might be expected to be somewhat different from that of phenolphthalein, but this was not determined. On account of the present cost of quinolinic acid, it is not probable that the indicator will find any extensive application in titrimetric work. The analogy, however, is considered of sufficient interest to warrant this brief paper.

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[CONTRIBUTION FROM THE DEPARTMENT OF CHEMISTRY, CORNELL UNIVERSITY.]

STUDIES ON THE CULTURE MEDIA EMPLOYED FOR THE BACTERIOLOGICAL EXAMINATION OF WATER.

II. LACTOSE-PEPTONE MEDIA.²

By E. M. CHAMOT AND C. M. SHERWOOD.

Received June 17, 1915.

The most important of all the qualitative methods for the bacteriological examination of water are unquestionably those in which advantage is

¹ *Ann.*, 288, 255 (1895).

² Read at the Rochester Meeting, American Chemical Society, September, 1913.