

*n*-Butyl *p*-Chloromercuri-benzoate,  $\text{ClHgC}_6\text{H}_4\text{CO}_2\text{C}_4\text{H}_9$ .—Eight g. of the crude acid chloride, prepared from phosphorus pentachloride, was refluxed for one hour with 75 cc. of *n*-butyl alcohol and the mixture filtered hot. The insoluble residue was 1.5 g. As the filtrate cooled, a cream-colored, flocculent precipitate separated. This was filtered off, washed with cold ethyl alcohol and dried at  $100^\circ$ ; yield, 56% (calculated on the basis of 6.5 g. of chloride). After successive crystallizations from *n*-butyl alcohol, ethyl alcohol and acetone, the melting point was constant at  $170^\circ$ .

*Anal.* Subs., 0.1071, 0.1001, 0.1179: Hg, 0.0527, 0.0491, 0.0580. Calcd. for  $\text{C}_{11}\text{H}_{13}\text{O}_2\text{ClHg}$ : Hg, 48.6. Found: 49.2, 49.1, 49.2.

The present work is being continued in the form of an extended study of the relations between the chemical and physiological properties of the *ortho*-, *meta*- and *para*-mercurated benzoic acids.

### Summary

1. *p*-Mercurated benzoic acid and a number of its derivatives have been prepared.
2. A study is being made of the properties of the three isomeric mercurated benzoic acids.

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### NOTE

**The Identification of Creatine.**—Mistakes and contradictions in statements concerning the properties of creatine caused the writers delay in the identification of a sample obtained from salmon flesh and submitted by Mr. Thomas D. Wyatt of the University of Oregon Medical School. Creatine is described in the following ways by different authors; bitter, biting substance, rhombic prisms;<sup>1</sup> rhombic prisms, tasteless;<sup>2</sup> rhombic prisms;<sup>3</sup> monoclinic, bitter, decomposes with effervescence at  $295^\circ \pm 5^\circ$  (uncorr.);<sup>4</sup> monoclinic prisms.<sup>5</sup>

We proved that the sample which was submitted was creatine, by analysis, quantitative loss of water of crystallization on heating and by conversion into creatinine, which was identified by the melting point of its picrate and by the Jaffe reaction. Samples of creatine were also purchased from two other sources for comparison and the properties studied.

**Taste.**—Four out of five persons, to whom samples were submitted, pronounced the substance tasteless, but the fifth described it as bitter. In the case of the individuals who declared it to be tasteless, a dry burning sensation was produced in the back of the mouth which was not noticeable for a minute or two but persisted for some time afterward.

<sup>1</sup> Mathews, "Physiological Chemistry," Wm. Wood and Co.

<sup>2</sup> Witthaus and Scott, "Textbook of Chemistry," Wm. Wood and Co.

<sup>3</sup> Hawk, "Physiological Chemistry," P. Blakiston and Sons.

<sup>4</sup> Mulliken, "Identification of Pure Organic Compounds," John Wiley and Sons.

<sup>5</sup> Beilstein, "Organische Chemie."

**Crystal System.**—Mr. Edwin Cox of the Geology Department of the University of Oregon, who examined the crystals made the following statement.

“The crystals are thin, tabular, monoclinic prisms, which when observed perpendicular to the 100 face, appear orthorhombic, and as this face is generally much more developed than either of the others, the crystals tend to lie upon it. However, when the crystals are observed perpendicular to the clino-pinacoid (010) they show a maximum extinction angle of 45 degrees.”

This statement explains why a cursory examination of the crystals might lead one to think that they are orthorhombic.

**Decomposition Temperature.**—When heated so that the temperature rises about 10° per minute, creatine darkens and finally undergoes decomposition with marked effervescence. Our results on the decomposition temperature do not check with those given by Mulliken as is shown in Table I. The percentage loss of water when the substance is heated to constant weight at 100° was used as a check on the purity of the creatine tested.

TABLE I  
DECOMPOSITION OF CREATINE

Sample	Source	Loss on heating, % (Calcd., 12.082)	Decomp. temp., °C. (corr.)
1	Salmon	12.072	293
2	Salmon	11.92	290–290.5
3	Eastman (recryst.)	12.085	291–291.5
4	Eastman (4 recryst.)	12.054	291
5	Pfanstiehl (recryst.)	12.14	291.5

The first temperature reading was taken on a long-stem thermometer to which the ordinary corrections were applied. The other readings were taken on a standardized short-stem thermometer. The value given by Mulliken<sup>4</sup> is 12–15° too high, as the uncorrected values corresponding to our corrected values would fall in the neighborhood of 280°.

Creatine may then be correctly described as forming monoclinic prisms which are tasteless to some individuals but bitter to others and which decompose with marked effervescence at about 291° (corr.).

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