95. *Derivatives of Benzaldehyde*-p-*arsonic Acid.*

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BENZALDEHYDE-*p*-ARSONIC acid and a number of its derivatives have already been described (J., 1931, 2388). This acid also undergoes condensation with such acids as malonic acid and cyanoacetic acid: p-*arsonobenzylidenemalonic acid*, $H_2O_3As{\cdot}C_6H_4{\cdot}CH{:}C(CO_2H)_2$, results in the former case and *cinnamonitrile*-p-*arsonic acid*, $H_2O_3As{\cdot}C_6H_4{\cdot}CH{:}CH{\cdot}CN$, in the latter. These examples indicate the reactivity of the aldehydo-group in benzaldehyde-*p*-arsonic acid and indicate that this compound may be a useful starting material for the preparation of unsaturated compounds containing the arsonic acid group. In view of the results previously described (*loc. cit.*), such compounds may have chemotherapeutic properties.

The *dichloroarsine*, *arsenious oxide* and the *arseno*-compounds derived from benzaldehyde-*p*-arsonic acid are also described.

p-*Arsonobenzylidenemalonic Acid.*—Benzaldehyde-*p*-arsonic acid (2·75 g.) and malonic acid (1·25 g.), dissolved in AcOH (12 c.c.), are heated on the water-bath for 1 hr. and the ppt. which separates on cooling is recrystallised from aq. AcOH (60%), forming colourless acicular needles, unmelted at 300° (Found: As 23·9; equiv., 82·5. $C_{10}H_9O_7As$ requires As, 23·7%; equiv., 79). The *acid* is readily sol. in H_2O and less sol. in AcOH.

Attempts to condense benzaldehyde-*p*-arsonic acid under similar conditions with ethyl malonate and malonamide were unsuccessful.

Cinnamonitrile-p-*arsonic Acid.*—Under similar conditions benzaldehyde-*p*-arsonic acid (2·3 g.) and cyanoacetic acid (0·85 g.) are condensed in AcOH (5 c.c.). The *product*, which separates when the mixture is kept for some hours at a low temp., crystallises from AcOH, in which it is readily sol., in colourless crystals, unmelted at 300°. It is sol. in H_2O and EtOH and insol. in Et_2O and C_6H_6 (Found: N, 5·1; As, 30·1. $C_9H_8O_3NAs$ requires N, 5·5; As, 29·7%).

So far it has not been found possible to obtain *p*-arsonocinnamic acid from *p*-aminocinnamic acid by the Bart–Schmidt reaction.

Benzaldehyde-p-*dichloroarsine*, $AsCl_2{\cdot}C_6H_4{\cdot}CHO$, was prepared by reducing a solution of the arsonic acid in EtOH–HCl aq., containing a trace of I, with SO_2. The oil rapidly solidified and then crystallised from C_6H_6–ligroin (b. p. 60—80°) in pale yellow needles, m. p. 105° (Found: Cl, 27·5. $C_7H_5OCl_2As$ requires Cl, 28·3%).

Benzaldehyde-p-*arsenious oxide*, $AsO{\cdot}C_6H_4{\cdot}CHO$, is obtained by passing CO_2 into a solution of the dichloroarsine in warm NaOH aq. The pptd. gum rapidly solidifies and is washed with H_2O. The *compound* cannot be recrystallised and has m. p. 232° (previous softening) (Found in specimen dried at 110°: As, 37·7. $C_7H_5O_2As$ requires As, 38·2%).

4 : 4′-*Dialdehydoarsenobenzene*, $(CHO{\cdot}C_6H_4{\cdot}As{:})_2$, is obtained by boiling a solution of benzaldehyde-*p*-arsonic acid (2 g.) in hot H_2O (10 c.c.) for a few mins. after addition of hypophosphorous acid (*d* 1·14; 10 c.c.) and then keeping it for a few mins. on the water-bath. The pale yellow solid is washed with H_2O. It cannot be recrystallised and decomposes at 240° (Found: As, 40·6. $C_{14}H_{10}O_2As_2$ requires As, 41·6%).

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